Yours truly

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THE EMBELLISHMENTS.

THE FARMER'S MAGAZINE.

JULY, 1852.

PLATE I.

PORTRAIT OF THE RIGHT HONOURABLE THE EARL OF DUCIE.

ENGRAVED BY J. B. HUNT, FROM A PAINTING BY G. V. BRIGGS, R.A.

PLATE II.

SHORT HORNED COW.

The subject of our second plate is a Shorthorned Cow, the property of the Right Honourable Lord Feversham, of Duncombe Park, Helmsley, Yorkshire, to which was awarded the first prize of Twenty Sovereigns in Class 8, and a Silver Medal at the Smithfield Club Cattle Show, in December last.

THE RIGHT HONOURABLE THE EARL OF DUCIE.

Henry George Francis Reynolds Moreton Baron Ducie and Moreton, of Tortworth and Woodchester, in the county of Gloucester, was born in the spring of 1802, and succeeded his father as Earl of Ducie in 1840; having married in 1826, Elizabeth, eldest daughter of Lord Sherborne, by whom he has a numerous family. The Ducies, according to "The Peerage," are no new creation, for they run directly back to the times of our first Charles, when one Sir Robert Ducie, a banker and Lord Mayor of London, had his loyalty and devotion to the luckless monarch taxed at a high price—losing, it is said, eighty thousand pounds in his support of the king's fortunes. The title, however, was not made out sooner than 1720, the second adopted, according to usage, by the heir of the house, being acquired by marriage with the Moretons, a family of long standing at Moreton, in Staffordshire.

In thus tracing the pedigree of the President of the Royal Agricultural Society, we come to find that, independently of his own individual taste and determination, there was every promise of his taking high rank as an agriculturist. Somewhere about the commencement of the seventeenth century the then head of the Ducie family had entered so fully into the business of the farm, and advanced so far before the spirit of his times, as to employ the celebrated Jethro Tull as his steward, and to support him in all those experiments and improvements which have made the latter's name so famous. This, however, is so well introduced, and the *perseverando* motto of the Ducies—past and present—so well exemplified in a paper before us, that we can very becomingly and appropriately re-produce it here. In a lecture given by Mr. W. H. Hyett, of Painswick, to the Gloucester Farmers' Club, in 1842, on the benefits which agriculture has derived from science, the speaker thus touches on our theme:—

"I am not wishing to persuade any of you to be a Tull: I know too well the difficulties and embarrassments which he had to encounter, to urge my practical neighbours to enter on so bold a system of innovation; but when the experiments of those who are justified in making them, shall have demonstrated the certainty of success, however bold the first innovation, and whatever the misfortunes of its author, it is to be hoped we shall hereafter at least

be a little less slow in admitting into practice such principles as those involved in the drilling and horse-hoeing husbandry of Tull. In thus touching on some of poor Tull's difficulties it will be pleasing, though perhaps not immediately to the point, for us who live in a county where exactly what he did for light soils, is now doing on one of our heavy vale farms (the Example Farm), by a spirit as enterprising as he possessed himself, to notice as we pass a source from which he received sympathy and encouragement. I found by accident the following quaint passage in the *Gentleman's Magazine* for 1764 :—'Mr. Tull employed himself assiduously in training of servants, and in accommodating the instruments proper for his new husbandry to their limited capacities: and this work he found much harder to accomplish than he at first expected; it was less easy to drive the ploughman out of his way, than to teach the beasts of the field to perform the work. The late Lord Ducie Moreton, who followed Mr. Tull, or rather accompanied him in this laborious and vexatious business, has very frequently, if I have been rightly informed—to correct the awkwardness of his ploughmen, or overcome their obstinacy—stript himself of his dignity, and put his hand to the plough himself; and yet with all this condescension in his lordship, and with all the vigilance, activity, and ingenuity of Mr. Tull, who was a most excellent mechanic, they were both forced at last, after a world of money expended to very little effect, to relinquish the project, and to content themselves with farming their lands in the ordinary way, except some small portions of it, which they reserved for further experiments.' The example of a nobleman lending a hand in so characteristic a way to encourage in his difficulties one of the most scientific and enterprising farmers this country ever knew, cannot but excite our admiration, but not the surprise of those who are fortunate enough to be acquainted with his counterpart in a living descendant."

"The living descendant" here alluded to is the nobleman whose portrait graces our present number. One who, whatever his success may have been, has set an example as a landlord that few indeed for practical utility or earnestness of attention have ever attempted to pursue. Placed in a district generally remarkable but for the apathy and imbecility with which the cultivation of land was carried on, as it long had been from one generation to another, his lordship resolved to incite his neighbours to the achievement of better things. The means whereby he sought to accomplish this are now, as they should be, well known, though we hardly know whether they have always been so fully appreciated. The Whitfield farm, for instance, was long the target for attack, especially with those adjacent to it. In answer to one of these, Lord Ducie himself has so ably demonstrated what he intended, and what he did not, in the establishment of the Example Farm, that we think it but justice to let him speak for himself:—

"I must explain what my real motives were in establishing Whitfield farm. I did not establish it as an example for the enlightened agriculturists in that neighbourhood—a neighbourhood unfortunately where ignorance is rife, and not only rife as to agriculture, but to other things as to which intelligence is of value. My object was to endeavour to open the eyes of such farmers to the value of improvements in agriculture. It was rather to arouse them to use their energies in preference to their easy chair; but I never intended to show an example to such farmers as Mr. Peter Matthews, or Mr. John Nicholls. Far from it. My only wish was to rouse my neighbours and tenants from a state of lethargy, and to infuse amongst them a spirit of enterprise and improvement. I am happy to say that the undertaking has been attended with the best results, of which a good evidence is given in the fact that we are establishing a farmers' club at Wickwar, hitherto one of the least enterprising districts in the county. As I have already said, I did not establish Whitfield farm as an example to the enlightened agriculturist; neither did I consider, when I undertook to drain a large portion of the land (for I knew, as Mr. Matthews remarked at Cirencester, that it was not every one who was able to lay out the capital), that I was giving an example to the renting farmer or men without capital; but I intended to give an example to the neighbouring landlords. I wished to open the eyes of the owners of the soil to the advantages which would accrue from the proper application of capital. I wished to show them that they would secure a much larger return by such improvements than they could derive from buying railway shares; and in this respect I am happy to say that my farm has not been a bad example; for I can state that many landlords, amongst others, Mr. Miles and Mr. Murray, are establishing farms for the benefit of their tenants, and of the farmers in the immediate neighbourhood."

Although for some period the Lord Moreton of those days had perhaps more repute as a master of foxhounds and a determined sportsman than a scientific farmer, his lordship very early in life took from six to seven hundred acres into his own occupation, and has never since been without some considerable quantity of land under his own management. The Example Farm he began with about the year 1836, and continued to hold it himself for five or six years from that period, when,

having brought it into a high state of cultivation, he let it to Mr. John Morton, who has occupied it up to the present season, when his lordship once more entered upon it.

The Uley works, another means of aid and example for the stand-still agriculturist, were opened by Lord Ducie in 1841. The object of these was the manufactory of improved implements, adapted to the country in which the works were erected. Whatever diversity of opinion may have existed as to the success of the Example Farm, there can be none as to the great benefit derived from the Uley establishment. Gradually, but certainly, "the cultivator" and other instruments have come into general request: while time and experience only confirm their value and utility. Having thus thoroughly answered their intention, by the general introduction of a superior description of agricultural implement into the country, the Uley works have now been discontinued, though the lasting improvement they have effected will ever remain as a tribute to the spirited and really patriotic man who originated them.

It is not only, however, by good buildings, first-rate machinery, improved implements of husbandry, thorough drainage, or any other liberal and judicious outlay, that Lord Ducie has distinguished himself as a good landlord and a good practical farmer. Perhaps the very strongest point in his character is the judgment and spirit with which he has continued to advance in the quality of his stock. That same quickness of eye and steadiness of purpose which ensured him one of the best stables of hunters, and as fine a pack of fox-hounds as ever were drawn from a kennel, has served his lordship equally well in that, perhaps, more worthy vocation to which he has since devoted himself. Few amateurs, or indeed practical farmers, can give more correctly the good points in an animal, as none have evinced more care or attention to them. It might be doubted whether any of even our best shepherds could be better relied on to cull from a pen of sheep; while his lordship's bid at a short-horn sale may be taken as equally good evidence of there being something worth having at the hammer. * Price then rarely stops him—a liberality which, backed with his own good judgment, nearly always shows a fitting return at his annual sales of young stock. But Lord Ducie's aim, here again, is the common good, more particularly of the neighbourhood in which he resides; for in addition to the benefit to be derived from crossing with such superior stock, he for several years put his name down for a premium of £50, to the Gloucestershire Agricultural Society, for the best bull exhibited. The application of this handsome contribution to the prize list has latterly been in some measure altered from the original terms in which it was offered, but the fact stands equally well to the credit of the good neighbour who gives it.

We think we have said enough to prove Lord Ducie's claim to that high position he at present occupies, viz., the president's chair of the Royal Agricultural Society of England. During his year of office we have every authority for saying his lordship has given the greatest possible satisfaction to those associated with him; applying himself earnestly and practically, as in all he undertakes, to the business of the society, and ensuring the respect of everyone who has been engaged in it with him. On the fifteenth of this month he completes the round of his duties by presiding over the society's dinner at the Lewes meeting, when we trust all who can, will by their presence do him that honour he has so fairly earned, as a liberal high-minded nobleman, a good "example" landlord, and a really excellent practical farmer.

METEOROLOGY, ITS CONNECTION WITH THE CULTIVATION OF THE SOIL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In a previous volume of this valuable Periodical, (vol. 34, Old Series, p. 287,) I had occasion to make some preliminary and general remarks upon the varying influence of atmospheric phenomena upon the ordinary products of the soil—and how much these influenced the operations of the farmer. In this

* Take only some of his purchases, within these very few years; at the Wiseton sale, in 1848, the Bull "Usurer" was knocked down to his Lordship for 400 gs.; at the same sale a two-year-old heifer, Volage, for 200 gs.; and at the famous Kirklevington sale, in 1850, he gave close on a thousand gs. for six animals—Duke of York, Duchess 55th, Duchess 59th, Duchess 64th, Oxford 6th, and Oxford 11th, two of them being young calves. While for proof of return, on the other hand, we know that three hundred guineas has been refused for the produce of one of these—Duke of Gloucester, a Bull Calf, from Duchess 59th.

paper I purpose to go a little more into detail, and to confine my observations to the varying amount of rain falling in different districts of England.

In commencing our examination of the depth of rain, which falls annually in different portions of the Kingdom, it will perhaps be a convenient course to traverse it in the first instance in a direction from West to East in lines, as direct as the situation of the places where rain gauges have been kept will admit, since by this means we keep as much as possible in the same latitude. Having thus crossed the Island in two or three different lines we can afterwards proceed from the South to the North of the Island, with the same objects in view. Let us then commence with the line of the Southern coast, and take the records kept at Truro, Exeter, Chichester, and Uckfield. We here find that in the years 1847 and 1848, there fell in these places a depth of rain (in inches) equal to *(Phil. Mag.)*

	1847.	1848.			
		the Quarters ending			
		Mar. 31.	June 30.	Sept. 30.	Dec. 31.
Truro . .	46.5	14.7	9.4	12.5	15.
Exeter . .	30.6	9.5	8.4	8.9	9.4
Chichester	20.8	9.5	7.6	10.2	8.9
Uckfield .	17.6	7.1	7.8	11.7	

Thus the mean depth of rain falling at Truro in these two years was 50.7 inches, at Exeter 33.4, Chichester 28.5. Showing a gradual decrease, as we leave the grass growing counties of Cornwall, Devon, and Somerset, and approach the corn producing districts of Hampshire and Sussex. But the mean depth of rain must in our enquiry be viewed in connection (amongst other facts) with the seasons of the year and number of days on which the amount of rain occurred. Now in these places the days on which any rain fell were as follows:—

	1847.	1848.			
		Quarters ending			
		Mar. 31.	June 30.	Sept. 30.	Dec. 31.
Truro . .	152	60	45	45	53
Exeter . .	150	55	42	52	50
Brighton .	133	57	39		
Uckfield .	121	48	41	45	

In this table the returns are incomplete, no record of the rain falling days were kept at Chichester, (I have inserted a return from Brighton in its place,) and at the two last towns only for the two first quarters of the year 1848. Yet still, an evident decrease, in the number of days in which rain fell, is perceiveable in our progress from West to East along the Southern shores of England.

Let us next in a similar direction traverse the Island, starting at Beckington, about a degree further to the North than the line with which we commenced.

This tour will include Beckington in Somersetshire, and Greenwich in Kent. The rain which fell at these places in the years 1847 and 1848 was

	1847.	1848.			
		Quarters ending			
		Mar. 31.	June 30.	Sept. 30.	Dec. 31.
Beckington	28.7	9.5	9.2	12.7	11.7
Greenwich	17.6	7.9	7.3	8.7	7.3

The mean of the two years being equal to 28.4 inches at Greenwich, and 35.9 at Beckington—of rain days in the same period there were at

Beckington	151	58	46	59	36
Greenwich	128	49	46	61	50

Giving a mean of the 2 years of 185 days at Beckington, and 167 at Greenwich. In both the amount and the frequency of rain, the grass growing pastures of the banks of the Somerset Avon, have a more considerable supply than the arable soils of the metropolitan districts.

In still advancing to the North of England, and in traversing the kingdom from West to East, we have for comparison the rain gauges of Liverpool, Derby, and Highfield in Nottinghamshire. In these the depth of rain collected in the years 1847 and '8 were

	1847.	1848.			
		Quarter ending			
		Mar. 31.	June 30.	Sept. 30.	Dec. 31.
Liverpool	31.6	7.9	7.9	8.9	7
Derby . .	28.2	11.8	8.5	11.8	8.1
Highfield House .	25	8.4	8.3	11.7	7.8

Shewing a mean fall of rain in these two years of 31.65 inches at Liverpool, 34.2 at Derby, and 32.6 at Highfield. The days at which rain fell were

Liverpool	177	52	47	54	51
Derby . .	169	56	47	52	64
Highfield	178	71	54	58	66

Thus the mean of these two years was 190.5 days at Liverpool, 194 at Derby, and 213.5 at Highfield, shewing that as we approach the Midland and Northern portions of the island the dissimilarity between the depth of rain and the rainy days on its Western and Eastern sides diminishes. The districts which a line drawn from Liverpool to Derby and Highfield intersects it will be noticeable, some of the most extensive cheese and growing districts of the kingdom —those of Chester, Derbyshire, and Nottingham.

We now approach the Northern limits of England, and we have here the gauges of Whitehaven on the Western side of the island, and those of Durham, and Newcastle, in nearly a parallel latitude on the East. The number of days on which rain fell in these places in the years 1847 and 1848, was as follows:—

	1847.	1848. Quarter ending			
		Mar. 31.	June 30.	Sept. 30.	Dec. 31.
Whitehaven	191	59	41	50	58
Durham .	134	38	41	39	53
Newcastle	130	41	36	31	42

Being a mean number of 200 at Whitehaven, 152.5 at Durham, and 140 at Newcastle. The depth of rain during this period was in inches

Whitehaven	42.9	16.1	6.2	11	14.1
Durham .	15.9	7.5	6.2	6.8	7.2
Newcastle	24.7	11.8	5.6	7.9	10.4

Being a mean depth of 44.75 inches at Whitehaven, 21.8 at Durham, and 30.2 at Newcastle. It is noticeable that the same greater prevalence of pasturage on the Western side of the island still exhibits itself, whilst he have on the Eastern, or drier portion of the island, the same fine arable system of cultivation which seems to follow its comparatively drier atmospheres from the county of Kent, thence to those of Essex, Suffolk, Norfolk, Lincoln, York, Durham, and Northumberland, to Edinburgh and Aberdeenshire. It is difficult to believe that in all this range of country, it is not the depth of rain which influences the general mode of cultivation adopted by the farmer—wherever we find (drawing a line from Truro to Exeter, from thence intersecting Beckington, and Derby, and Liverpool,)—the larger mean depth of rain falling, there we find in general the majority of the lands devoted to grass. In confirmation of this conclusion let us next examine the Western and Eastern rain gauges in juxtaposition, and for that purpose let us traverse the island in a Northernly and Southernly direction.

Here we shall observe the same result—facts not difficult of explanation. For as Mr. J. H. Belville remarks in his valuable little manual on the Thermometer, "England is subject to a variable climate, not only from its insular form, but it is liable to further violent changes from the never-ceasing antagonism of a warm maritime climate on its western side, with a cold continential climate on its Eastern. The great Atlantic, which washes the West and South-west shores of England, produces in those counties exposed to its influence, a warm moist atmosphere, for the Westerly winds which constantly prevail there carry thither the warm air from over the sea, and the vapour with which it is laden is condensed, as it reaches the colder land, in a misty scud, which drenches every object with moisture, although no drops of rain may fall. The wide difference in the amount of moisture falling on the two sides of the island may be seen from the records of a single year, viz., 1844. In the following table the monthly depth in inches is given. In col. I. at Exeter; II. Liverpool; III. Kendal; IV. London; V. Thetford; VI. North Shields:—

	Western side.			Eastern side.		
	I.	II.	III.	IV.	V.	VI.
January	2.940	2.530	5.804	2.760	2.070	2.184
February	2.400	3.450	4.540	2.345	2.485	1.664
March .	2.960	2.760	6.015	2.884	1.650	1.697
April . .	0.360	1.260	2.861	0.381	0.215	0.720
May . .	0.000	0.810	0.143	0.335	0.395	0.470
June . .	1.760	3.100	3.757	1.481	1.700	1.768
July . .	1.030	5.270	3.249	2.885	1.275	1.927
August .	2.740	3.550	3.448	2.885	1.945	1.846
Sept. . .	1.400	2.990	5.385	1.423	1.360	2.030
October	2.620	2.990	4.212	3.975	3.940	1.476
Nov. . .	3.420	1.270	3.129	3.620	2.480	1.340
Dec. . .	2.160	0.120	0.469	0.425	0.590	0.606
Mean .	23.790	30.100	43.012	24.376	20.105	17.728

The effect of this widely different supply of rain may be regarded in another point of view. Every inch of rain is equal to a weight of rather more than one hundred tons per each imperial acre. So that the mean annual weight of rain falling on the Western counties, exceeds the mean amount of the rain of the Eastern counties, by several hundreds of tons per acre.

In connection with the fall of rain, another important question, closely related to our enquiry, presents itself—viz.,—1st, *the Season of the Year*, in which these phenomena occurred; and secondly, the *distance of time* which usually intervenes between one day of rain, and another. Let us then again cross the island in a Northerly direction, and examine these facts, and see what depths of rain and what number of rainy days occurred at three distant stations, viz., Chiswick, Boston, and Orkney, in the spring months (March, April, and May), and the summer months of June, July, and August, of the years 1847 & 1848.

	1847.				1848.			
	Spring.		Summer.		Spring.		Summer.	
	Days	Ins.	Days	Ins.	Days	Ins.	Days	Ins.
Chiswick	37	3.08	41	3.87	46	6.39	61	10.11
Boston . .	34	7.75	28	5.17	35	5.56	48	10.89
Orkney .	47	7.16	42	8.48	44	5.72	47	8.08

The consideration of facts like these (and in a future paper, I hope to add more of the same kind to aid the English Farmer,) is fraught with interest to the agriculturist. Many conclusions may be drawn by the cultivator from the patient observations of the Meteorologist: for instance, it is evident that the Scotch Farmers possess a considerable superiority of climate over their Southern neighbours for the growth of oats and turnips, whilst their English brethren have greater advantages for the cultivation of barley and mangel wurzel—that these observations to some extent also apply to the Eastern and Western sides of England—and that a soil which is of medium fertile moisture in the Eastern counties, would be too wet for some crops if placed on the Western side. Such researches too, add other links to the chain of evidence, which demonstrates the great importance of science to agriculture.

THE SCIENCE OF MANURING.

BY THOS. ROWLANDSON, C.E., F.G.S.

CHAPTER II.

The Inorganic Constituents of Plants.

Having shown the mode by which the inorganic constituents of plants are introduced into and assimilated by the vegetable organism, it is now necessary, in order duly to appreciate the relative value of each particular mineral constituent, to examine the respective quantities of each description found in the various crops more commonly cultivated. For this purpose the following tables are given, drawn up by Professor Johnston.

Potatoes.	Calculated without Carbonic Acid.	Calculated with Carbonic Acid.
Potash	43·18	52·40
Soda	3·20	3·88
Lime	1·80	2·20
Magnesia	3·17	3·85
Oxide of iron	0·44	0·53
Sulphuric acid	15·24	18·50
Phosphoric acid	8·61	10·45
Chlorine	4·81	5·84
Silica	1·94	2·35
Carbonic acid	18·29	
	100·68	100·00

Proportion of Water, of Organic, and Inorganic Matter in the Potato Top. By Professor Johnston.

In the Stem.		Cold dry.	In the Leaves.		Cold dry.
Water	89·73		Water	85·22	
Organic matter	8·49	82·67	Organic matter	12·51	84·55
Inorganic matter	1.78	17·33	Inorganic matter	2·27	15·45
	100·00	100·00		100·00	100·00

Of the Inorganic Part of the Potato Tuber.

(a) *The young tuber.*

	1. Buffs from Mid Lothian.	2. South Americans.	3. Ash-leaved Kidneys.
Ash per cent.	0·80	1·16	0·95
Do. calculate dry	4·32	5·42	4·45

(b) *The full-grown tuber.*

	1. Buffs from Mid Lothian	2. Red Potato from Lanark.	3. White Potato from East Lothian.
Ash per cent.	0·78	0·96	0·75
Do. calcul ted dry	3·36	4·01	3·75

(c) *In successive periods of growth.*

	Buffs from Mid Lothian.							
	Old Sets.			New Potatoes.				
	1	2	3	4	5	6	7	8
	May 30	June 13	June 27	July 25	Aug. 8.	Aug. 15	Aug. 22	Aug. 29
Ash per cent.	0·64	0·65	0·705	0·80	0·70	0·78	0·79	1·93
Do. calculated dry	5·52	19·88	12·940	4·32	3·90	3·36	4·70	5·35

The average of a number of analyses of the Potato gave—

For the dry potato .. .. 3·57 per cent. of inorganic matter.
Potato in the natural state .. .. 0·87 „ „ „

AVERAGE OF WATER, ASH, &c., IN TURNIPS, ACCORDING TO MESSRS. WAY AND OGSTEN.

	WATER.			ASH.			ASH DRY.		
	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.
Bulb	92·7	86·0	90·0	1·13	·48	·73	10·90	4·00	7·30
Top.....	90·0	79·0	85·5	2·64	1·19	1·84	18·00	8·00	12·98

According to the analyses of Professor Way a crop of 20 tons of bulbs or roots, and 4 tons of leaves of turnips, mangold wurzel, and carrot, will respectively withdraw from the soil, or, in common parlance, exhaust it, to the extent here set forth, viz:—

	Turnips.	Mangold Wurzel.	Carrots.
Phosphoric acid	45 lbs.	21 lbs.	39 lbs.
Sulphuric acid	50 „	22 „	57 „
Lime	90 „	21 „	197 „
Magnesia	14 „	22 „	29 „
Potash..	140 „	133 „	134 „
Soda	33 „	70 „	103 „
Chloride of sodium (salt)	57 „	160 „	85 „
	429 „	449 „	664 „

An average crop of wheat will remove from an imperial acre:—

Silica	84 lbs.
Phosphoric acid	20 „
Lime	8 „
Magnesia	6 „
Peroxide of iron	1 „
Potash	23 „
Soda	1½ „
	143½

Twelve tons of potato, tubers will remove of—

Potash	150 lbs.
Soda	12 „
Lime	9 „
Magnesia	20 „
Sulphuric acid	60 „
Phosphoric acid	33 „
Chlorine	18 „
	202

From which Fromberg calculates that a ton of artificial manure, composed only of the mineral ingredients, for the potato crop, ought to be proportioned as follows:—

Potash	1180 lbs.
Magnesia	87 „
Soda	77 „
Lime	50 „
Sulphuric acid	416 „
Phosphoric acid	235 „
Chlorine	195 „
	2240 „

At a future period we will examine how far the above proportions agree with the amount of manure (either farm-yard or special) applied to the crops ordinarily cultivated.

Having thus given a brief review of some of the physiological circumstances connected with the growth of plants, and also tolerably copious tables of the inorganic constituents of some of our usually cultivated plants, the reader will be now prepared to understand the rationale of the action of manures. It is not my intention to enlarge on the sources whence the organic constituents of plants are derived, it being taken for granted that all such as consist merely of carbon and hydrogen, as oils, or carbon, oxygen, and hydrogen, as woody fibre (lignin), starch, sugar, gum, organic acids, &c., are formed by the decomposition of carbonic acid and water, perhaps also occasionally by the absorption of oxygen from the atmosphere. There are, however, other substances in plants, of great importance in the vegetable economy, which, in addition to carbon, oxygen, and hydrogen, contain another constituent—azote or nitrogen, and in a few instances phosphorus and sulphur also, the latter being found in the seeds of cruciferous plants. It has been attempted by Liebig and others to prove that if plants are adequately supplied with their mineral constituents, nitrogen will be absorbed from the atmosphere. It is possible that this theory may be true in part; but every-day observation shows that a moderate application of azotised manures is invariably followed by a luxuriant crop, provided the inorganic constituents essential for fertility are also present; it would, therefore, be by no means safe for the farmer to abandon the use of substances containing nitrogen. We shall defer the consider-

ation of this subject for the present, as we shall have abundant opportunities of recurring to it when occupied with the question of farm-yard liquid and special manures.

On Farm-yard Manure.

Seeing that by withdrawing crops from a field we take away a certain amount of substances essentially requisite to the formation of vegetable organisms, it will be obvious that by returning the same to the soil we again restore it to the original state. This, however, cannot be done in practice by relying only on the ordinary manure heap of the farmstead, as a constant waste takes place annually on every farm by the sale of corn, wool, meat, and bone in cattle and sheep, milk, cheese, &c., leaving commonly the most bulky but least valuable articles, as hay and straw, at home to make manure; an evident waste therefore takes place on every farm, and, in addition thereto, there is also constantly carried away a portion of fertalizing substances by solution in rain water,* even after farm-yard manure has been applied to the soil. In part, this is in some degree replaced by fresh mineral ingredients being set free from soils by the slow but certain and constantly decomposing action of carbonic acid and moisture; notwithstanding this aid from nature, it is well known that in practice it takes the produce of many acres to restore fertility to one that has been exhausted. One source of loss has just been indicated; but there are others much more serious, which will be hereafter alluded to. On reflection, it must also be obvious to all, that manure, to be of the greatest efficacy, ought to be in that state which, whilst not of too great solubility, yet is sufficiently so to be decomposed during the time occupied by the growth of the crop to which it is applied.

In preparing a manure heap, the farmer ought therefore to be careful, in the first place, to preserve and collect all matters containing the organic and inorganic constituents of the crops which he cultivates; and, 2ndly, if the matters so collected are not in a form likely to be absorbed by plants, to render them so by artificial means. The course usually pursued for the first object, is to collect all the excrements (usually mixed with straw) voided by the animals in the cattle sheds, styes, stables, straw yards, &c., throwing the whole into a heap, where it remains until carted to the field. Generally, little care is taken to preserve the urine voided by cattle, &c., except such as may be absorbed by the straw.

* Perhaps this loss is not so great as is commonly imagined; at least, Professor Way's experiments on the absorptive properties of soils point to such a conclusion.

Much has been written with respect to the second object—such as turning over the heaps periodically, in order to promote a greater and more equal fermentation. This plan has had both strenuous advocates and adversaries; amongst the latter is Boussingault, who states: "From what has now been said, it will be understood how destructive to good manure is the custom which obtains in certain countries of turning dungheaps frequently—of airing them as it were, in order to hasten their decomposition. Treated in this way, stable litter does, in fact, decompose much more rapidly; but it does so—and I own I do not myself clearly perceive the object proposed by it—at the expense of the quality; for it is very evident that the volatile principles must be dissipated and lost in the same proportion as their points of contact with the air are multiplied." I am inclined to doubt that so serious a dissipation of the volatile principles (ammonia) of farm-yard manure takes place in consequence of turning over the heaps as stated by the French chemist, and am more inclined to agree with the advocates of old fermented manure, that the loss sustained principally consists of carbonic acid and moisture; in fact, Boussingault admits on the authority of Thaër, that air collected from the surface of a dungheap undergoing moderate fermentation, does not contain much more carbonic acid than that which is taken from the mass of the atmosphere. Neither does a vessel containing nitric acid, when placed upon the fermenting mass, produce those dense white vapours which are certain indications of the presence of ammonia. In preparing farm-yard manure, the quick decay of vegetable fibre is of great importance, for two reasons—viz., it prepares the straw, so that it can be easily broken by the fork or cut by the spade, in which state it is also easier worked into the ground by the plough; whilst, at the same time, the inorganic constituents of the straw, &c., are set free. The due fermentation, therefore, of the whole mass of the dungheap is of primary importance. In conducting this, some circumspection is required; for, if allowed to acquire too high a temperature, the mass becomes what is commonly termed "fire-fanged," and sometimes actually inflames; in either case, little more than the inorganic constituents remain. It may be here remarked, that the circumstances just stated ought to be conclusive evidence against the truth of the theory, that we have *only* to place upon our fields the inorganic constituents of the crops which we draw from them, in order to produce perpetual fertility; otherwise, firefanging in our dungheaps would be a benefit rather than an injury; but all practical farmers know that the contrary is the case. The opposite circumstance—the non-production of sufficient

heat—is attended with the disadvantage of leaving the straw in a tough state, so as not to be easily worked.

I shall only at present briefly notice what appears to be the general opinion: it is borne out by the best writers, and agrees with my own experience, viz., that, in preparing a manure heap, too great care cannot be taken to mix intimately the produce of stables, cattle sheds, styes, &c.; for the mixture is always found to produce that slow but perfect fermentation most advantageous to the objects of the farmer. This might be anticipated, as horse manure is known to be prone, especially in hot weather, to heat violently, and frequently if care is not taken, to fire; on the other hand, the manure from cattle sheds does not ferment readily. For the due preparation and economising farm-yard manure it is indispensably necessary that it should be sheltered. It cannot be a matter of indifference whether the surface of a manure heap is kept at 90 deg. in the shade or 120 deg. in the sun for days together; and, with respect to rain, it must be evident to all that every drop which falls, and subsequently exudes from the heap, must rob it of some of its fertilizing ingredients. I have ascertained by experiments that the first oozings from a manure heap contain the greatest amount of inorganic substances as well as the largest quantity of ammonia. Allusion is here made to the liquid running from a heap in the fresh or unfermented state; it may also be remarked, that a considerable portion of the salts which exude at this period are in the state of carbonates. The drainings from a manure-heap that has fermented a few days, and collected after a shower of rain, possess a dark-brown appearance, and, if allowed to settle, will become tolerably clear. When this occurs, and it takes place during the fermentation of all manure heaps, it is an indication that in the process of decay, humic acid has been formed, which, combining with the ammonia or the fixed alkalies, exude in the state of brown-coloured humates: in this manner one-third, probably one-half of the value of farm-yard manure, as ordinarily prepared, is lost. If the phenomena attending the fermentation of manure heaps is investigated, it will be found that humic acid must be produced during the decay of woody fibre with the simultaneous formation of carbonic acid and water, accompanied by the disengagement of the alkalies potash and soda, which immediately combine with the humic acid, forming humates: these being very soluble are carried away by the first shower of rain that falls, unless precautionary measures have been taken to prevent such waste, which unfortunately is seldom the case. Were it not for some counteracting causes, manure heaps exposed during an entire winter would lose the whole of their fertilizing properties. The counteracting causes arise from the property which the insoluble humates of lime, magnesia, &c., and also some black insoluble carbanaceous compounds possess of retaining ammonia and the alkalies to a certain extent. Were it not for this circumstance, our manure heaps as ordinarily prepared would become destitute of all their valuable substances, with the exception of the almost insoluble neutral phosphates of lime and magnesia, sulphate of lime, &c. It is true that the fermentation of manure heaps cannot proceed without the aid of moisture; but ordinarily formed farm-yard manure contains sufficient moisture when taken out of the offices for its adequate fermentation, if it is not subsequently allowed to evaporate by too free an exposure to the sun and wind. A shed would remedy this evil. Moisture is not the only circumstance necessary to produce fermentation in a manure heap: oxygen must also be present, and this is afforded by the atmosphere.

If a manure heap is surrounded with an atmosphere of carbonic acid gas, scarcely any fermentation will take place, whatever degree of moisture may exist therein. If, therefore, means are devised for limiting the admission of the atmosphere, we shall, to a certain degree, obtain a control over the fermentation of the heap, by which means the evils arising from the formation of much humic acid will, in a great degree, be remedied.

The fermentation of manure heaps depending as it does on the joint presence of heat, moisture, and the atmosphere, the skilful farmer will avail himself of the means in his power to promote or retard fermentation, by dispensing with, or admitting, one or other of these agents as the case may require. This can be done in several ways: to enumerate and explain all would, however, take up too much space; I shall therefore confine myself to a few general rules, and to modes of proceeding which are within the capacity of the humblest cottager.

The free admission of the atmosphere is one of the principal causes of excessive fermentation, and Boussingault, although he does not state this to be the *cause*, admits that "it is of much importance that the heap be pretty solid, in order to prevent too great a rise of temperature and a too rapid fermentation, which is always injurious. At Buhelbronn, our dung-heap is so firmly trodden down in the course of its accumulation, by the feet of the workmen, that a loaded waggon drawn by four horses can be taken across it without very great difficulty." Notwithstanding what has just been stated, many able writers on this matter have asserted that trampling down manure is injurious;—each party is right according to circumstances. If a manure heap is required for almost immediate use, nothing is more certain than that a free admission of air is necessary,

in order to promote rapid fermentation"; but this is done at the expense of a considerable amount of its volatile contents. On the other hand, if intended to lie for some months, (as is frequently the case,) pressure, and consequently more limited admission of atmospheric air, is advantageous, fermentation being by this means retarded, and consequently proceeds more equally throughout the mass.

At some periods of the year it is a matter of considerable importance to the farmer that he should have the means of converting his fresh into well fermented manure in a short time.

It is particularly recommended that all extraneous moisture other than the drainings of the offices should be kept from the manure heap, and these ought to be conveyed to the pit through tunnels: no water should be permitted to enter, unless thrown on for some special purpose.

By restricting the admission of the air, a direct command is obtained over the fermentation of the manure heap; but practically this can only be accomplished by placing the manure in pits; if a rough covering is given to it, so much the better. The usual form of a manure heap is either a cube or a parallelopipedon, each being a figure of six sides, five of which are exposed to the influence of the atmosphere, the bottom only not being surrounded by it. By using pits this order will be completely reversed: one side—the top—only being exposed to the atmosphere; with this additional advantage, that from the altered position of the heap, in relation to the air, the top being the only surface directly exposed to its influence, is precisely that by which it can penetrate with the greatest difficulty; as it can only enter to fill up the vacuum caused by the gradual evolution of carbonic acid, vapour, and heated air; whilst with ordinarily formed dung-heaps the atmosphere can freely penetrate through the sides, thus causing a draught, accompanied by the more rapid evolution of vapour and carbonic acid through the top of the mass, the free admission of oxygen causing the heat to still further increase, in consequence of which a more vigorous fermentation ensues—fire-fanging being the frequent result.

To prevent the evils arising from the present mode of forming manure heaps, it is recommended that farm-yard manure should be invariably thrown into pits either dug out of the ground or partially so, and walled round to the height of about four feet from the surface. Fire-fanging is unknown in pits so formed; and this mode has the further advantage that the manure, commonly called cold, such as those from the cow-house, which only slowly decompose, has the rotting process hastened owing to the caloric evolved in closed pits being only slowly dispersed, and consequently conducing by its prescence to the required decay. Pits have therefore the double advantage of retarding fermentation in cases where that is likely to be injurious, and retaining heat where it is most required.

It sometimes occurs that pits so made become filled above their tops, in which case the superior portions will be in the condition of ordinarily formed dung-heaps. When this has happened I have not unfrequently observed that it was requisite to remove the upper portions, or turn it over in order to prevent firing. It is also worthy of observation that where the manure is heaped up above the level of the pits, and the sides are consequently exposed to the action of the atmosphere, the manure so made never has the same appearance as old fermented manure. This cannot be accounted for from the shorter period that has elapsed since the upper portion exposed to the air has been gathered, for I have often carefully observed and marked the time requisite to produce the appearance of well-fermented farm-yard manure placed in pits, and exposed in the ordinary manner, and I have invariably remarked that a more perfect and uniform decomposition takes place in that placed in pits, and also in less time.

It might be supposed that a considerable amount of ammonia escapes. Such, however, is not the case; neither is much heat evolved from manure pits. I have often been present at the removal of manure from pits constructed as here recommended, the heat from which is seldom so great as that found in ordinarily formed heaps; but, unlike the latter, it is not confined to the centre, whilst the sides are comparatively cool: on the contrary, an equable temperature pervaded the whole mass, no smell of ammonia was perceptible, but vapour of water was being copiously given off.

These facts strongly confirm the correctness of the opinion that in order to produce a speedy and equable decay of manure, it ought to be thrown into pits, instead of being exposed in the ordinary manner.

Another advantage derived from using pits is, that in winter the caloric arising from the fermentation of the heap is not so speedily dissipated when surrounded by a cold frosty atmosphere.

It is well known that winter-made manure does not ferment freely. So well is this understood that it has become an axiom that one load of manure formed in summer is worth two made in winter. I need not enlarge as to any particular mode of constructing the pits here recommended, as every sensible farmer, when convinced of the correctness of the system, will easily select the fittest place, and the best mode of constructing them, as adapted for his own peculiar circumstances. As a general rule they ought to be impervious, if the soil will permit it: if not, they

ought to be made so. A rough covering, though not indispensably requisite, would be a great improvement. Pits made as just described will convert the ordinary mixture of cattle and horse manure into well fermented farm-yard manure in the course of three weeks or a month in summer, and in winter in about six or eight weeks,—advantages sufficient to induce every careful farmer to adopt the system, by which means the fertilizing ingredients will be preserved with a smaller amount of loss of its volatile and fixed valuable contents than by the method usually pursued.

During some years on large farms no inconsiderable amount of animal matter, such as vermin, &c., is thrown away, thus polluting the atmosphere; whereas if they were thrown into a close pit, amidst twitch, weeds, &c., and mixed with fresh horse manure, they would add materially to the quantity and value of the heap, besides assisting in making away with a quantity of rubbish: from experience I know that the germinating property of twitch can be thus destroyed.

By whatever mode farm-yard manure is prepared, under all circumstances a large quantity of humic acid is formed. The manner in which humic acid, which forms soluble salts with several alkalies, becomes by lengthened fermentation converted into a black substance insoluble in alkalies, is only at present imperfectly if at all understood. The result of my own observation is this, that in heaps formed in the open mode a larger amount of humic acid is formed, which is found soluble in alkalies, than when made in close pits having a more limited access of air: in the latter case some humic acid is formed. In both cases the soluble humic acid so formed is identical with the humic acid which exists so abundantly in barren peat mosses or turbaries; which humic acid has a strong tendency to unite with the alkalies potash, soda, ammonia, &c., forming the deep brown-coloured solutions, which are invariable seen to ooze from manure heaps after rain. Seeing that every drop of brown-coloured liquid, so oozing, contains in solution a greater or less amount of salts of potash, soda, or ammonia, it must be evident that from this cause alone a very serious diminution of the valuable constituents of the manure heap is constantly taking place. Placing the manure in pits will in a great measure remedy this evil; at all events, it will prevent the liquid running to waste. It is not, however, here meant to convey the impression that this brown-coloured liquid possesses any great fertilizing properties, for such is not the case. It can, however, be easily made so, by using a little well-slaked lime in small quantity; as the lime will then combine with the humic acid, and set the alkali free: no escape of ammonia will take place, provided the lime is used in small quantities, in the form of milk of lime. It may be here remarked that the insoluble compounds of humic acid with lime, as well as those carbonaceous compounds formed during the decay of straw, &c., which are insoluble, appear to possess the property of absorbing and retaining very appreciable quantities of alkalies and alkaline salts, and ammoniacal substances, in a manner analogous to charcoal; it is on this property that the value of the carbonaceous matters of farm-yard manure principally depends; and probably also, as a slow and continuous source of carbonic acid, it may indirectly be a source of fertility. In stating this, however, it is not meant to convey the impression that the carbonic acid thus formed is directly absorbed by plants, and thus causes a greater luxuriance of growth; for all experiments prove that if the other conditions requisite for fertility are present, the carbonic acid of the atmosphere is always in sufficient abundance to supply the requisite amount of carbon. Repeated and carefully performed experiments, have however proved, that after silica (sand), granite, &c., have been subjected for a lengthened period to the action of boiling muriatic acid, in order to dissolve out the whole of their alkaline contents, the residue has been acted on by carbonic acid. The carbonaceous substances of the manure heap are therefore indirectly sources of fertility, in consequence of their giving off carbonic acid slowly but continuously during their decay, which carbonic acid acts on the minerals existing in the soil, to a limited extent rendering them soluble, and consequently fit for absorption by the spongioles of the roots of plants.

The following analyses of farm-yard manure are given: they will have to be referred to occasionally when we compare the value of farm-yard manure with the recently introduced and more portable substances, which are generally classed under the generic title of special manures.

The first analysis I shall give is one by Dr. Richardson, of Newcastle-upon-Tyne; it was made on farm-yard manure taken just previous to being applied, and was found to consist as follows:—

	Fresh.
Water	64·96
Organic matter	24·71
Inorganic salts	10·33
	100·00

	Dried at 212°.
Carbon	37·40
Hydrogen	5·27
Oxygen	25·52
Nitrogen	1·76
Ashes	30·05
	100·00

INORGANIC MATTERS.

A. Portion soluble in water.

Potash	3·22
Soda	2·73
Lime	0·34
Magnesia	0·26
Sulphuric acid	3·27
Chlorine	3·15
Silica	0·04
	13·01

B. Soluble in muriatic acid.

Silica	27·01
Phosphate of lime	7·11
Phosphate of magnesia	2·26
Phosphate of iron	4·68
Carbonate of lime	9·34
Carbonate of magnesia	1·63
Sand	30·99
Carbon	0·83
Alkali and loss	3·14
	86·99
A. Portion soluble	13·01
B. Ditto insoluble	86·99
	100.00

By Messrs. Allen and Greenhill, pupils of Mr. Nisbet.

	Farm-yard manure from Kent.	Farm-yard manure frm Surrey.
Per centage of ash	9·2	9·6
Silica	79·79	71·32
Potash	3·32	5·14
Soda	0·92	1·68
Lime	6·90	12·32
Magnesia	0·56	0·82
Common salt	1·43	1·22
Phosphate of iron	2·04	2·03
Phosphate of alumina	1·53	2·54
Sulphuric acid	1·89	1·57
Phosphoric acid	1·58	1·27
Manganese	a trace	..
	99·76	99.91

It is very important to observe that of the entire mass of farm-yard manure carted on to the land, about 65 per cent. of it is only water, and of the remaining 35 per cent. 25 is inert carbonaceous matter, only serviceable as a source of carbonic acid, for which purpose a mixture of peat and lime will answer equally well, leaving only 10 per cent. of inorganic substances, and 0.6 per cent. of nitrogen as true fertilizing matter. Of the 10 per cent. of inorganic substances, there are only three that are of much value, either as regards their commercial price or relative scarcity: we can obtain in abundance, and at a cheap rate, the following substances, viz.:—

Common Name.			Chemical Term.	Chemical Composition.			
Chlorine and soda	in	Common salt	Chloride of sodium	Chlorine 35·47*	+ Sodium	23·31=58·78	Chloride of sodium
Lime, either	in	Lime, or as	Lime	Calicum 20·52	+ Oxygen	8.01=28.53	Lime
Carbonate of lime	in	Limestone and chalk, or combined with	Carbonate of lime	Lime 28·53	+ Carbonic acid	22·1 =50·54	Carbonate of lime
Magnesia	in	Magnesian limestone, as a carbonate	Dolomite and Magnesian limestone				[usually combined with one or more atoms of water.
Sulphuric acid	in	Gypsum	Sulphate of lime	Lime 28·53	+ Sulphuric acid	40·1 =68·54	Sulphate of lime,
Silica	in	Sand, flint, quartz, granite, sandstone, &c.	Silicic acid	Silicon 22·22	+ Oxygen	8·1 =30·23	Silicic acid.

* The proportions here set down are the invariable combining quantities; for instance, 35·47 lbs. or grains of chlorine gas combines with 23·31 lbs. or grains of the metal sodium, forming 58·78 lbs. or grains of chloride of sodium (common salt).

It will be observed that there is a marked difference between the per-centage of silica in the ash analyzed by Dr. Richardson and those of Mr. Nisbet's pupils; this may be accounted for by the manure which Dr. Richardson analyzed having originally been composed of a less proportion of straw, whilst at the same time the superior amount of phosphates in the first analysis may be attributed to a larger amount of grain having been used by the cattle or horses. The superior amount of potash in the manure from Surrey, may arise from the fact that a large part of it had been gathered from cattle that had been fed upon turnips or similar green food, as it must be always remembered that the manure voided by animals will differ in quality according to the food that has been given to them; the quality will also vary according to the circumstance whether the animals are young or fattening, manure from the latter being much more valuable than manure from the former, and is easily accounted for. Young and growing animals constantly require an addition of inorganic substances for the development of their frame, muscles, and tissues; phosphoric acid and lime, with a small quantity of potash, magnesia, and common salt, being the principal substances that are required. It must be apparent to every one that a much greater amount of inorganic substances exist in the full four-year-old ox than in the calf; but the ox had no means of obtaining these organic substances other than from its food. When a full-grown ox is put up to fatten, with fully developed muscle, bone, tissue, &c., little or no extra inorganic matter will be required for its further development; consequently, instead of a portion of the inorganic constituents of its food being required for assimilation by the animal organism, the whole are voided in the excrements, which, if all source of loss could be prevented, would (cæteris paribus) on being applied to the soil restore it to the same state of fertility in which it existed at the period of sowing the produce which the animal thus consumed. In fattening animals there is scarcely any source of loss in the inorganic constituents of the food, and of the organic matters merely carbonic acid, and a small quantity of nitrogen exhaled by the lungs and skin; of these the only loss which is of practical importance is nitrogen, which however is exceedingly small, and if the urine and excrements are carefully collected and stored, very little nitrogen, either in the form of ammonia or otherwise, will escape. Carbonic acid being abundantly supplied to vegetables by the atmosphere, its loss is therefore of little consequence. The reason why so little loss of the inorganic and nitrogenised constituents of vegetables takes place in fattening cattle arises from the circumstance that whilst fattening they are only forming fat, which is a combination of hydrogen and oxygen, therefore not requiring for its formation either nitrogen or inorganic substances: these oleaginous matters are derived principally from the sugar, starch, &c., of their food; there is therefore a sound reason for the farmer's assertion, that it is the last pound of fat that pays the best. From the decreased action of the lungs a less consumption of the carbon of the food (evolved as carbonic acid by the lungs) takes place; whilst at the same time nearly the whole of the nitrogenous and inorganic substances of the food are voided in the liquid and solid excrements. The superiority of the manure from fattening cattle, irrespective of the better quality of the food consumed, is thus accounted for. A fact of some importance, both as regards rearing and feeding cattle, as well as concerning the economy of the manure heap, may here be mentioned. It is well known that young, commonly called store stock, will thrive with food on which fattening cattle would scarcely hold their own, or possibly deteriorate: this remark holds good whether it has respect to pasturage or shed feeding. Matured well-fed cattle will lose condition if placed on the common white turnip, whereas yearlings will do well with them. This observation applies also to hoggets and wether sheep, the greater vital energy of young animals rendering them able to derive nutriment from food which the weaker digestive powers of a maturer age appears incapable of assimilating. In some instances it has been observed that young animals have improved more rapidly when fed on the common white turnip, than when served with the more nutritious swede; and this can be rationally accounted for. Whilst there is a material difference between the feeding properties of the common white and Swedish turnip, the proportion of ash to the root is nearly equal. To obtain an equal amount of nutriment, animals feeding on the common and less nutritious turnip, are compelled to eat a larger quantity, at the same time injecting a greater amount of inorganic substances, which are assimilated by the growing tissues, bones, muscles, &c.; from which drawbacks it might be theoretically assumed that manure from growing stock cannot possibly be of equal value with that derived from fattening cattle. In a somewhat similar manner manure from milch cows is not of equal value with that formed by dry cattle, in consequence of the phosphoric acid and alkalies removed by the milk.

From the tables given, of the composition of the inorganic matters of farm-yard manures, it will be seen that more than eighty per cent. consisted of substances of little money value, and can be had from the mineral kingdom both in abundance and at little cost. Of the remainder, potash, phosphoric acid, and their compounds, form the greater

part, the proportions of which may be respectively taken at

3·5 per cent. phosphoric acid on the ash, or ·35 on the manure.
3·5 per cent. potash on the ash, or ·35 on the manure.

In other words, in an average of farm-yard manure there will be found 7·8 lbs. of potash and 7·8 lbs. of phosphoric acid to each ton. Now, 7·8 lbs. of potash is equal to 14·3 lbs. of sulphate of potash, which can be bought at the rate of about 16s. per cwt.,* commonly known as *sal enixium*. The 7·8 lbs. of phosphoric acid would be equivalent to the quantity found in 56 lbs. of common bones; therefore in estimating the value of the inorganic constituents of ordinary farm-yard manure, it will be seen that

	s.	d.
14 lbs. of sulphate of potash (sal enexium), at 16s. per cwt. will cost ..	2	0
65 lbs. of bones, at 5s. per cwt.	2	6
Value per ton of inorganic constituents of farm-yard manure	4	6
To which perhaps ought to be added, for sulphate of lime, salt, &c.	0	6
Total value of inorganic substances in farm-yard manure	5	0

Having shown the value of the inorganic constituents in farm-yard manure, we have next to examine the value of the organic constituents. Hydrogen is obtained from water; oxygen can be obtained from either the atmosphere or water; with regard to carbon, reasons have already been given to show that it can only indirectly be a means of fertility, viz., as a source of carbonic acid; nitrogen, in the form of ammonia or nitric acid, is undoubtedly, as daily experience testifies, an excellent fertilizer. Judging from the analysis, there is good reason to suppose that the sample of manure analyzed by Dr. Richardson was of a quality above the average; I shall, therefore, assume the amount of nitrogen contained in the average of farm-yard manure at 0·5 per cent., in which proportion there would be 11·2 lbs. of nitrogen in a ton of manure, which would be equivalent to 13·6 lbs. of ammonia, or equal to 68 lbs. of the common sulphate of ammonia of commerce, which may be procured for about 6s. 6d.; from which it will appear that the value of a ton of farm-yard manure, comparing it with the commercial price of like substances, would be as follows:—

	Per Ton.
Inorganic substances	5s. 0d.
Nitrogen (valued as sulphate of ammonia)	6s. 6d.
Total.....	11s. 6d.

* The wholesale prices may be something less than this, but the farmer will not obtain it in quantities of a ton or two at a lower rate.

—a price considerably higher than that ordinarily placed on manure made in the farm-yard, the general value in agricultural districts not being estimated at more than 5s. to 6s. per ton, to which has to be added from 1s. to 2s. per ton more for labour in carting, spreading, &c. From these calculations it certainly appears that farm-yard manure ought to be the means of promoting a greater degree of fertility than that which we are accustomed to see. On this subject we shall have more to say when we come to the consideration of special manures. One great source of loss arises from the circumstance that a large portion of its soluble contents (ammonia, potash, &c.), is washed away by rain.*

It has sometimes been disputed whether it is most profitable to use fresh made or old fermented manure; an opinion, however, greatly preponderates in favour of the latter mode, and in which we concur. There are cases, however, in which fresh made manure may be advantageously used; amongst the crops to which it may be applied with the greatest benefit we may name potatoes.

There cannot be a doubt that, weight for weight, old manure is better than new; but if it takes three tons of new to make two tons of old, little advantage can be practically derived, unless the two tons of old will produce as much fertility as the three tons of new. One very obvious cause of old manure being of better quality than new is the fact that the inorganic constituents are more concentrated; in other words the manure is, weight for weight, proportionably richer in the elements of fertility. Another cause arises from the circumstance that the woody fibre being decayed, the inorganic constituents are partially set free; whilst in fresh manure all undecayed vegetable fibre has to undergo decomposition before the inorganic substances contained in it can be rendered soluble.

With respect to the liquid manure, which is allowed so generally to run to waste from our farmsteads, it may be here remarked, that if carefully conveyed by tunnels to manure pits such as previously recommended, and a rough covering placed over the latter, equal care being also taken that the rain-water from the roofs and yards is kept out, it will be found in practice that the liquid manure will not amount to more than is required to keep the whole heap tolerably moist; if any quantity should accumulate a good plan is to have a pump placed so that the urine, &c., can be occasionally pumped over the top, by which means undue heat may be checked, whilst at the same time it will tend to convert the whole mass into an equal quality. Having shown the composition and prin-

* Professor Way and Mr. Thompson's experiments throw some doubt on this point.

ciples which ought to be pursued in collecting and managing that valuable adjunct of the farm, we shall defer treating on the relative quantities that ought to be applied to different crops until the whole subject of manuring is reviewed, at which period the matter of special manures will also be taken into consideration. It is admitted on all hands that a large part of the most valuable matters of farm-yard manure is lost by the present method of forming open manure heaps, which leads us to the consideration of the preservation and application of liquid manure.

CHAPTER III.

On Liquid Manures, and the Construction of Tanks or Reservoirs for their Preservation.

It has already been observed that, under proper management, the liquid manures from our stables, &c., if kept free from admixture with extraneous water, is no more than sufficient to keep the dung-heap in a moist state. As, however, the subject of liquid manures at present occupies considerable attention, it is not deemed unfitting here to make a few remarks on the subject, particularly as it is calculated to further illustrate the best mode of preserving the fertilising substances produced on the farmstead.

The following details of experiments made by Professor Johnston will serve to confirm the remarks made previously whilst describing the best mode of managing manure heaps:—

1. The liquid first experimented on consisted of the drainings from heaps of cow-dung exposed to rain. It was dark coloured, containing what the rain-water is capable of washing out of similar dung heaps. It was neutral; but ammonia was given off when it was boiled, or when quicklime was added.

An imperial gallon of these drainings, when evaporated to dryness, left about 480 grains, or a troy ounce weight of dry solid matter. The solid matter consisted of

	Grains.
Ammonia	9·6
Organic matter	200·8
Inorganic do. (ash)	268·8
	479·2

The inorganic portion consisted of

	Grains.
Alkaline salts	207·8
Phosphates of lime and magnesia, with a little phosphate of iron	25·1
Carbonate of lime	18·2
Carbonate of magnesia and loss	4·3
Silica and a little alumina	13·4
	268·8

From this analysis it appears that the rain is capable of washing out much valuable matter from common cow-dung. The ammonia is not so large in quantity as in many other forms of liquid manure, because most of the substances voided by the cow which are capable of producing ammonia pass off with the urine. On the other hand, the urine of the cow contains no phosphates, whilst these washings contain a considerable quantity.

2. The second liquid analysis consisted of the drainings of farm-yard manure when watered with cow's urine. This was also neutral; but gave off ammonia copiously when boiled or when mixed with quick-lime. An imperial gallon, when evaporated, left 617½ grains of dry matter, considerably more than the former liquid; and this matter consisted of

	Grains.
Ammonia	21·5
Organic matter	77·6
Inorganic matter, or ash	518·4
	617·5

The inorganic matter contained in this liquid consisted of

Alkaline salts	420·4
Phosphates of lime and magnesia	44·5
Carbonate of lime	31·1
Carbonate of magnesia and loss	3·4
Silica and a little alumina	19·0
	518·4

It thus appears that, unless means are employed to preserve the urine, &c., thrown over dung-heaps, the loss is not confined to the urine alone, but includes other fertilizing substances carried off in solution.

The average quantity of urine annually voided by man, the cow, and the horse, amounts as follows:—

Man	1,000 lbs.,	contains of solid matter	67 lbs.
Cow	13,000 „	„ „	900 „
Horse	1,000 „	„ „	60 „

As an illustration of the loss sustained by a farmer who allows his liquid manure to run waste, let an example be taken of what occurs on a farm of 500 acres, consisting of 400 acres of arable and 100 of pasture, and the stock on such a farm to be about 50 head of oxen, 20 horses, and 60 pigs, besides sheep, leaving out of the calculation the urine from sheep, and confining it to the other stock named. 45,000 lbs. weight, or upwards of 20 tons of dry fertilizing matter, is contained in the liquid excrements of these animals, which, if valued at the price of guano, viz., £10 per ton, would be worth £200 sterling per annum. The urine of the horses would yield an amount equal to 1,200 lbs., or nearly 11 cwts., worth £5 10s. From the pigs nearly two tons, worth £20. The value of the urine of a cow for twelve months is estimated in Flanders to be worth £2 per head; calculated at the preceding

ratio it would appear to be equivalent to about double that sum.

The liquid manure from the stables, &c., ought to be conveyed in covered conduits from the respective offices, by which means it will be preserved from becoming too diluted in consequence of mixture with rain-water. In Flanders a practice obtains of mixing the liquid manure with five times its weight of water in order to dilute it, this manure being found too powerful when used undiluted. It is also found from experience, that to obtain the greatest amount of benefit from liquid manure, it should, previous to its application to the soil, have undergone the putrefactive fermentation; this will be hastened by preserving the liquid manure as undiluted as possible prior to its immediate use.

The best mode of constructing tanks will vary according to the character of the rock, soil, gravel or other material out of which it will have to be excavated. The ground best adapted for this purpose is a stiff clay; in such a soil nothing can be easier than the construction of a manure tank. A rubbly wall, or boards closely jointed, so as to form a support to prevent the falling in of the clay, will answer all the purposes desired when covered, which may be done with an arched roof, or by strong rough planks. In cases where the clay is somewhat permeable the tank may be made tight be means of puddling. In constructing walls for tanks common mortar ought not to be employed, as it is somewhat speedily destroyed by the action of the liquid manure; for such purposes a hydraulic cement, or water mortar, ought to be used. In some districts this can be easily obtained; but in the majority of instances it will be found somewhat expensive. It may, therefore, be well to mention here that a good useful hydraulic mortar can always be made wherever clay and lime can be had. By igniting clay and lime together an excellent hydraulic mortar will be obtained. This hint may be found useful in the construction of many agricultural offices besides manure tanks.

The ordinary mode of distributing liquid manure is by means of an old oil or wine cask mounted on wheels, with an irrigating apparatus similar to that applied to common street watering carts. A better mode is by means of hose with a rose, if the place to be irrigated is within a moderate distance; in any case, however, irrigation by liquid manure will be found most economical by applying it to the fields adjacent to the point of collection.

A means of applying liquid manure has been recently suggested, of a somewhat novel nature, viz., by what is called sub-irrigation. Experiments on this subject are, however, as yet too few to fairly test its merits. The mode has many advantages; but, on the other hand, there are also many disadvantages.

When possible, liquid manure ought to be applied to the surface either preceding or following rain (but not in very rainy weather). In the absence of such opportunities periods of heavy dews may be taken advantage of. An attention to meteorological phenomena is of much consequence in applying liquid manure. An ordinary pump will be found the best mode of drawing liquid manure from tanks. When, however, a tank is elevated some height above the level of the surrounding fields, plans may easily be devised to save considerable labour by applying liquid manure in the manner of ordinary irrigation. If a steam-engine is on the farm its services may be used in a variety of ways, to the saving of both manual and horse labour.

As guano will probably still remain a monopoly, the result of the recent deputations to the government having proved nugatory, it now more than ever behoves farmers to economize every possible description of fertilizer. In many cases it may be found much more convenient to save the liquid manures of the farmstead by means of absorbent materials rather than by the construction of tanks or similar receptacles for its preservation and distributing it in a liquid form. For this purpose peat earth, where it can be obtained, is an admirable material; it ought not, however, to be used alone, but invariably intermixed with clay, chalk, or a small quantity of lime; if the latter material is used the compost ought to be made up at least a fortnight previous to use. Peat earth, mixed with chalk, makes an admirable material for this purpose; when peat cannot be obtained, ditch scrapings, hassock, or other rough sods abounding with carbonaceous matters will serve the purpose. Clay should not be used alone if it can be avoided, but always mixed with a little chalk or lime, the latter to be preferred. The rationale of the last recommendation may be explained by reference to the phenomena indicated by Professor Way in his recent lectures on "the absorbent properties of soils," to which the reader must be referred for full particulars. It may, however, be here briefly noticed that the talented Professor, to whom the agriculturists of Great Britain are so much indebted, in the lectures alluded to proved that the absorptive powers of soils, more especially in retaining the principal fertilizing substances, as ammonia, &c., was due to the existence in the soil of a hydrated double silicate of alumina and lime. The mixture recommended is calculated to fulfil those conditions. The use of absorbents for the preservation of liquid manures is, in many respects, more generally adapted to ordinary English farming than the construction of tanks. To obtain the whole of the benefit that may be derived from absorbent materials will, however, necessitate the formation of dung pits with a rude covering akin to that indicated in a former part of the present paper.

LONDON FARMER'S CLUB.

The subject for discussion at the usual monthly meeting of the London Farmers' Club on Monday, June 7, was, "To what extent can landlords afford substantial relief to their tenantry in the present emergency, without involving any considerable outlay of capital?" It will be seen from the report which appears in our columns this day, that doubts were cast upon statements made by the opener in reference to two important agricultural operations, draining and thrashing. In respect to draining, the proposition affirmed was that, "draining may be effected with Fowler's plough at about 30s. per acre." In order to arrive at a proper interpretation of this statement, it must be observed, that the question of expense forming a most important ingredient in the case, the *cheapest* mode was suggested, and which would not be applicable in all cases, although, seeing that the heavy clay lands are those which now need draining to the largest extent, the mode pointed out would be applicable to a considerable proportion of the land requiring drainage. It cannot be doubted that it is an important question, whether land can be drained with Fowler's plough, or by any other means, at 30s. per acre. Now in order to elucidate this question, we request attention to the following extract from Mr. Pusey's report on the agricultural implements shown at the Great Exhibition, which appears in the 28th number of the *Journal* of the Royal Agricultural Society:—

"But for the American reapers, Mr. Fowler's draining plough would have formed the most remarkable feature in the agricultural department of the Exhibition. Wonderful as it is to see the standing wheat shorn levelly low by a pair of horses walking along its edge, it is hardly, if at all, less wonderful, nor did it excite less interest or surprise among the crowd of spectators when the trial was made at this place, to see two horses at work by the side of a field, on a capstan which, by an invisible wire rope, draws towards it a low framework, leaving but the trace of a narrow slit on the surface. If you pass, however, to the other side of the field, which the framework has quitted, you perceive that it has been dragging after it a string of pipes, which, still following the plough's snout, that burrows all the while four feet below the ground, twists itself like a gigantic red worm in the earth, so that in a few minutes, when the framework has reached the capstan, the string is withdrawn from the necklace, and you are assured that a drain has thus been invisibly formed under your feet."

After some remarks upon the improvements which have been effected in this machine, Mr. Pusey goes on to observe—

"As to the economy of using the draining plough, it is too expensive to purchase, unless for a large landowner; but it may be hired by the year or month. Its inventor is also ready to execute work at his own risk by contract, at a saving of from one-third to two-thirds in hand labour; the greater the depth the greater being the saving. I have only seen the actual cost of two drainages that have been made by this plough. They were both without tiles and shallow, being only 2½ feet deep. Taking the highest of them, and adding the cost of tiles, the price of tile-draining land at that depth, and at 33 feet apart, would be 14s. only for work, and with 1¾-inch pipes at 15s. per 1,000—18s. 9d. for tiles—altogether £1 13s. 9d., including horses and hire of machine. The plough goes as well, however, at a depth of 4 feet, nor would the additional cost be material. The plough has worked on the following farms:—

	Acres.	Depth. ft.	in.	
Mr. Fowler, Melksham.....	14	2	6	with pipes.
Mr. Newman, ditto	10	2	0	ditto.
Mr. Blandford, near ditto.....	30	3	6	ditto.
Mr. Purch, Down Ampney	100			without pipes.
Mr. Hall, Brentwood	200	2	6	w. & wt. pipes.
——— Wormwood Scrubbs..	40	2ft. to	4ft.	with tiles.
Mr. Harris, Darlington (now working)	3	6		

In clay subsoils, with a gentle fall, the success of this new implement seems to be beyond a doubt; and in all circumstances the inventor is ready to undertake the risk of the execution."

This report fully bears out the statement that "with Fowler's plough drainage may be effected at about 30s. per acre."

The other disputed question was in respect to the cost of thrashing, the opener of the discussion having said, "I am informed by a practical man, an agent, that he has known as much as 10s. per acre difference in the thrashing of corn upon two adjoining farms." Now it must be here observed that it is not stated that 10s. per acre could be saved generally, but that such a difference in the different modes of performing that operation had been observed. In contradiction to this statement it was asserted that 2s. per qr. was the average price for thrashing wheat. Upon this question we will also refer to some authorities. Mr. Raynbird, in his essay on "Measure Work," published in the 7th volume of the "Journal of the Royal Agricultural Society," states the price of thrashing wheat to be from 2s. 6d. to 3s. per qr. Mr. Pusey, in the report above referred to, in treating of the several steam-thrashing machines, of the comparative merits of which a trial had been made, remarks, "The price of thrashing wheat by flail varies with the yield and the district from 2s. 6d. to 4s. a quarter. Three shillings then will not be an unfair average. If the rick hold 40 quarters we must add 5d. for barning, and the cost will be 3s. 5d. per quarter." After making a calculation of the expense of thrashing a rick of corn—which with the horse-machine would occupy three days, but which by steam might be thrashed in one day—he goes on to observe, "The cost of steam-thrashing will be 9d.; the saving, as compared with hand-thrashing, 2s. 8d.; or, with horse-thrashing, 1s. 3d.—an average of 2s. per quarter on wheat." It may further be observed that Mr. Raynbird, in his

Essay on Agriculture, in a comparative statement made from actual experience, makes the cost of thrashing by horse-power 1s. 6d. per quarter; by steam-power, 10d. per quarter. Mr. Bravender, in his Prize-essay on the Farming of Gloucestershire, states the cost, by Mr. Morton's machine, to be 10½d. per quarter, in the following terms: "The machine not only thrashes the corn, but shakes the straw, winnows the corn, and causes it to pass down a spout to the ground-floor, to which spout a bag is attached, which, when full, is removed by an attendant, the corn being winnowed, screened, cleaned, bagged, and ready for the market." He further adds, that "the wear and tear of the machine and engine" are included in the price stated—10½d. per quarter.—Mark Lane Express.

LONDON FARMER'S CLUB.

"TO WHAT EXTENT CAN LANDLORDS AFFORD SUBSTANTIAL RELIEF TO THEIR TENANTRY IN THE PRESENT EMERGENCY, WITHOUT INVOLVING ANY CONSIDERABE OUTLAY OF CAPITAL?"

The usual monthly meeting took place at the Club Rooms, Blackfriars, on Monday evening, June 7, Mr. W. F. Hobbs in the chair.

The subject for discussion was introduced by Mr. Shaw, and was thus stated on the card:—To what Extent can Landlords afford Substantial Relief to their Tenantry in the present Emergency, without involving any considerable Outlay of Capital?

The CHAIRMAN said the subject which was about to be introduced was one of great importance, not only to the tenantry of this country, whom everyone must admit to have been placed in great difficulties for a long period, but to the agricultural interest generally; and if Mr. Shaw could mark out any course whereby the landlords of the country could give the tenantry substantial relief, he would be conferring a great boon on all classes concerned.

Mr. SHAW said—Before proceeding to lay before you the observations which I have prepared on the question for discussion, I wish to make one or two introductory remarks, in order to prevent misapprehension. In the first place I would refer to an observation made by the chairman, who has spoken as if I had undertaken to bring forward this subject with the view of pointing out to landlords how they might substantially benefit their tenantry. Now, I beg leave to state, that I am actuated on this occasion by the motives which have influenced me on former occasions of the same kind, when I have introduced subjects important in themselves, not with the expectation of being able to make any valuable suggestions myself, but with the view of eliciting from practical members of the club observations which could not fail to be useful to the agricultural body. That I should make any novel suggestions of my own is not probable. If I have been able to collect together a sufficient number of points of discussion so as to elicit the truth, the end which I seek will have been attained. I wish it to be understood, then, that I bring forward the subject merely for the purpose of provoking discussion, and any suggestions which may be advanced by me are not proposed as a remedy for the difficulties by which agriculturists are at present surrounded. (Hear, hear). In the next place, I would observe that the view which I have taken of the subject is based upon low prices. I have assumed in my own mind that low prices are to continue; and therefore, although some of my suggestions may appear rather trivial, this will be owing to the fact that when men find themselves in great difficulties, they are sometimes disposed to grasp at straws in the endeavour to save themselves. (Laughter). Having made these remarks for the purpose of preventing misapprehension, I will now proceed to submit for your consideration the question "To what extent can landlords afford substantial relief to their tenantry in the present emergency, without involving any considerable outlay of capital?" Although the subject may seem to be of a limited character, yet upon examination it branches out into so much detail that it will be impossible to do more than refer to it generally without exceeding the bounds which are usually prescribed in introducing subjects for discussion at these meetings. Whatever may be the opinion entertained in reference to the necessity or propriety of the great change affecting agriculture which has been effected by recent legislation, I apprehend few, if any, will be disposed to deny that a revolution, of a much more serious character than even those who advocated that change had anticipated, has been produced. There are many large landed proprietors who have for a considerable period expected such a result, and have been preparing themselves for it; while a great number, who entertained a different opinion, being taken by surprise, are suffering most severely from its effects. Looking at the constitution of the legislature, we cannot come to any other conclusion than that however severe may have been the pressure from without, the proprietors of the soil became consenting parties to this great legislative change, affecting themselves and their tenantry, for the purpose of protecting their own property; and hence, inasmuch by far the heavier weight of the blow falls upon the tenantry, I hold that the landlords are in duty bound to make every reasonable sacrifice to lessen the intensity of that blow. Were the relations of landlord and tenant based upon sound and independent principles, it might not have been necessary to expect such an amount of consideration from the landlord; but having regard to the dependent and unsatisfactory position of the tenantry generally, large concessions are expected, and must be made. The landowners, constituting, as they do, a majority of, or, at all events, commanding a majority in the legislature, have it in their power to

make such improvements in the laws affecting real property, as will enable tenants for life, trustees, and corporate bodies, to make abiding contracts with tenants, and exercise other acts of ownership calculated to permanently benefit their estates. The principle has already been admitted in regard to drainage and the erection of buildings upon entailed estates; and there is no doubt but that necessity will, in due course, further reforms of a similar character. Large landed proprietors whose property is unencumbered, whose estates have been well managed, and whose land has been let upon moderate terms, will find no difficulty in meeting and surmounting the difficulties they have to encounter. The owners of large estates which although unincumbered have been badly managed, and though moderately let are badly farmed, will, of course, have more difficulties to contend with than those before referred to; but as in such cases there will be no obstacles to obtaining funds, a judicious and careful system of management will enable them to grapple with "the present emergency." If, in either of the cases referred to, the land had been let at rents fully proportionate to the former value of agricultural produce, a reduction commensurate with the depreciated value of produce must be made. When the reduction involves a re-valuation, the greatest care is requisite, or that step may be the cause of working great injustice to an improving tenant, who by expending capital on improvements has brought his farm into good condition, and has consequently rendered it more valuable, but has not yet received a return for his outlay. The previous remarks will apply to small properties similarly situated, with this difference, that, inasmuch as the owners of smaller estates being less subjected to family charges, and the income of the estate being mainly applied to the necessary expenditure of a family and establishment, there will be a margin afforded for reduction of rent, through the reduced price of the necessaries of life. The great and serious difficulty will be experienced in those cases, whether of large or small properties, which are more or less encumbered, where the property has been badly managed, the buildings suffered to fall into decay, the tenants disheartened, and probably the land in bad condition—a necessary result of want of care and attention on the part of the landlord. Now, we would here premise, as the first and most important step to be taken by the landed proprietor, who, from his rank in society, want of practical experience, or general engagements are such that he cannot superintend the management of his property, to employ an experienced practical agent, who is capable not merely of collecting the rent at quarter-day, but who is competent to judge of the extent to which buildings require addition or amendment, and the most economical mode of effecting such repairs, and who has such experience in the practice of farming as will enable him to prescribe such a course, or suggest to the tenants such improvements in their system of management as are in conformity with the best practice of the day. There are few estates in such good condition that an agent of experience and ability will not be able to suggest some positive improvement. To meet my view of the case the agent must be a practical man, one who, if he be an occupier of land himself, can set an example of what may be done by skilful management. A friend of mine, who has a very extensive business as manager of estates at this moment, keeps 8 cows, 50 sheep, and 5 horses the year through, on 16 acres of land, and only 6 of it arable: had he more arable he could do much more. The most fatal mistake made by landed proprietors is that of regarding the office of agent as one which affords them an opportunity of providing for some private friend, utterly incapable of performing the duties of the office, except so far as integrity and correctness at the rent-audit is concerned. Another egregious piece of folly is that of supposing that the legal ability which enables a man to make a correct draft of a lease clogged with antiquated covenants qualifies him pre-eminently for the post of land-agent. I believe that to no circumstance so much as to this may be ascribed the impediments interposed to improvements in agriculture by binding the tenants to obsolete systems, utterly unfitted to the practice, experience, and exigencies of the present day. Where the estate is not of sufficient magnitude as to require the entire services of an agent, the advice of such a party should be taken as to the course of management to be adopted; and it would in most cases amply repay the small proprietor to secure the periodical supervision of a competent agent. Where ample capital is at command there will be no difficulty with the assistance of an experienced agent to bring an estate into good condition; but the great difficulty which I fear has to be encountered, and to a very great extent, in "the present emergency" is to afford assistance to the tenantry where the means of the proprietor are limited; and hence it is desirable, nay, I might almost say absolutely necessary, that the object should be attained "without involving any considerable outlay of capital," and it is upon this point I am anxious to obtain the opinion of the members of the club. Having secured the assistance of a competent adviser, the first point for consideration, and the readiest, if the estate will admit of it, is, as it seems to me, to grant a lease of twenty-one years, with liberal covenants, or enter into an agreement, giving stipulated compensation for certain improvements, to be particularised, which may be effected by the tenant, should he be required to quit before he has reimbursed himself for his outlay. I am well aware of the disinclination to take leases which has been evinced hitherto by English tenants in a great many counties; but I am inclined to believe that in the altered state of circumstances in which we are now placed there will be less disinclination in future than there has hitherto been. In respect to the proprietor, if he seeks to obtain his object "without incurring considerable outlay of capital" he must make a sacrifice. And here I would observe that so serious do I consider "the present emergency" that I regard it the duty, as well as the interest of the reversioner or other party interested, without whose assent leases could not be granted, permanent agreements made, timber cut down, and other similar acts performed, to willingly give his concurrence to measures so eminently calculated

to benefit all parties, and which from peculiar circumstances have become absolutely necessary. Assuming, then, that an estate is capable of improvement by draining, by the removal of hedge-rows, thereby adding from 10 to 20 per cent. to the acreage of the farm, independently of the economy of labour obtained by straight fences and good-sized fields, instead of crooked fences and small fields, and by chalking or liming, or, where there is a command of water, by irrigation upon the catch-meadow system described by Mr. Robert Smith and others in the *Journal of the Royal Agricultural Society*, I incline to the belief that by fixing a moderate rent, and consequently at a small sacrifice, the landowner may avoid that "considerable outlay of capital" which would be necessary were he to put the farm into condition by executing all these improvements at his own expense. Should there be any inferior grass land upon such a farm, the permission to break it up will be advantageous immediately to the tenant, and ultimately to the landlord. The removal of the hedge-rows and timber will further benefit the occupier, by preventing the damage to crops which is occasioned to such an enormous extent where the land is encumbered with them. In order to show that this is no theoretical notion of mine, and that tenants will effect great and permanent improvements where security is given for the investment of capital, I will refer to the discussion of a question brought before this club by Mr. Robert Smith in April, 1848, in which he designates the security to capital afforded by a lease, or agreement giving compensation for unexhausted improvement, "the union of landlord and tenant." Having previously referred to the improvements in the Lothians, and in Norfolk, he observes—

"I could wish that a similar union of interest between landlord and tenant pervaded the whole empire, and which it would be easy to accomplish if the landlords of England would more generally meet the enterprising tenantry of our country, by giving them a guarantee against the vicissitudes of uncertain tenure. The laying out of equitable fields, the straightening of fences, the removal of hedge-row timber, are also important points to be adjusted, and may readily be accomplished by a union of interests. The importance of breaking up inferior grass lands is a subject but little understood, at the present, by the landlord, and requires to be noticed; as, from the knowledge I have of the subject, I am convinced that immense results follow the judicious application of the plough to certain inferior soils, by which means the whole arable part of the farm shares in the increased manure thus afforded; hence supplies more food for our increasing population, gives increased employment to the agricultural labourer and artisan, and, lastly, improves the farm for letting to a future tenant many shillings per acre; as, while poor grass-land is the bane of a farm, new arable land is an acquisition. In fact, the straw grown upon some lands, after breaking up, is worth more than the herbage when in previous grass. But in thus recommending the breaking up of certain grass-lands as an acquisition to the farms, I must beg distinctly to state, that it should alone be granted to those tenants whose farms are in a healthy state of cultivation, and thus require more employment; but in no instance to those parties that merely ask the favour, that they may linger on a little longer in their already neglected occupation. The reclaiming of open districts and commons is a subject of national importance, and is profitably accomplished by liberal leases, as adopted by the late Earl of Leicester in reclaiming the Norfolk sands. The improvement of water-courses, roads, and irrigation, when performed by the tenant, is another proof of the importance of giving protection to the investment of capital. And though last, not least, I may mention the immense results that would follow, by the increased demand for labour, and consequent reduction of the poor-rates, as also the moral condition of the whole district improved. Another feature of importance occurs in the economy of manual labour, by having the labourers located upon the farms, which is readily accomplished by the tenant paying the landlord a per-centage on the outlay for building cottages, or by security to the tenant when he is required to build them; but in either case the landlord should allow the tenant full control over them, or in time they might possibly become the greatest pests of the occupation. In thus detailing the leading movements of the farm as briefly as possible, it leads me to the real position of the subject under discussion, as in every instance it is shown that upon a union of interest between landlord and tenant hinges the increased productions of the soil; and from the practical knowledge I have had of the various customs of tenure throughout the country, I am prepared to show that such union is strength, and that it is best supported and carried out by long leases, or security for unexhausted improvements; under which agriculture has made rapid strides, tenants have flourished, and the property of the landlord doubled in many instances; in support of which I would for a moment direct your attention again to the county of Norfolk, where, by the union of landlord and tenant, under long and liberal leases, the blowing sands of Norfolk have become rich and fertile fields; and the result in both a rural and national point of view is apparent to the common observer, as we frequently notice the majority of the cattle supplies in Smithfield market quoted under the head of Norfolks. Again, under the security of tenure practised in the north of Lincolnshire, we find not only the rabbit-warren and heath converted into splendid arable fields, but that the barren and neglected hills of the Wolds have also been brought into the highest possible state of cultivation; and that while they abound in abundance of corn, and supply the greatest weight of mutton per acre of any district in England, the whole has been successfully accomplished under 'security for unexhausted improvements,' or what is commonly called 'tenant's-rights;' and I may venture a remark (which is of the utmost consequence), that the whole has been accomplished without the landlord scarce knowing what has been going on, beyond the daily improved appearance of his estate, and that while on the one hand it has cost him nothing, beyond the nominal guarantee, the estate has been improved by the tenant's capital at least 300 per cent."

If, however, the proprietor chooses to execute the draining and erect buildings himself, leaving the other improvements only to the tenant, he can effect these objects by the assistance of the General Land Drainage and Improvement Company, who will execute the whole upon moderate terms, repayment being made by a small per-centage extended over a long period, the greater part of which he will be annually reimbursed by the increased rental which he will receive for his estate. I have reason to believe that the advantages offered by these companies in draining land and erecting buildings is not sufficiently known and appreciated by the landowners of the kingdom. Much will depend upon the character of an estate, the size of the farms, and the condition of the tenantry both as to capital and progress in agricultural

improvements. It is manifest that several measures may be adopted for aiding the tenants of small or moderate-sized farms, which would be inapplicable to those of magnitude, where the tenants have capital at command, and possess skill and experience to apply it advantageously. In respect to buildings, it is asserted upon competent authority that a covered yard can be erected at the cost of one year's rent of a farm. Such an outlay effected by the assistance of the General Land Improvement Company, the repayment being spread over a number of years, would not "involve a considerable outlay of capital." I believe draining may be effected with Fowler's plough at about 30s. per acre, and if on a farm of 300 acres 30 were drained every year it would not involve a large outlay. Where chalk or lime has not been used, but is applicable to the soil, and within reasonable distance, an expenditure for either of these articles, to be applied under the advice of the agent, would not be costly, yet would be productive of lasting benefit. The same remark will apply to guano and other artificial manures where they are not generally used. I believe that boxes for cattle may be erected at from £3 10s. to £4 each: two or three constructed yearly on a moderate-sized farm, if required, would not involve much expense, and yet if added every year would soon afford ample accommodation to the tenant. The purchase of a portable steam thrashing machine for the use of the tenantry, they paying only such small sum as may be necessary to keep it in repair, "does not involve a large outlay," and yet may be a saving to the landlord in barn-room and the number of barns, and to the tenant in the cost of thrashing his corn. I am informed by a practical man, an agent, that he has known as much as 10s. per acre difference in the thrashing of corn upon two adjoining farms. The same remark will apply to cider-mills in the cider counties, the cost of which, I believe, ranges, when fixed, at from £50 to £75 each and involves the necessity of an additional building on each farm. The reaping machine will afford landlords another opportunity of aiding their tenantry in some districts at a small expense; and there are many agricultural implements, the use of which might be introduced most advantageously, if the landlord were to provide them, and place them at the disposal of his tenantry. Again, in districts where little attention is paid to the quality of the stock bred, the keeping a stallion or bull or boar for the use of the tenants might be adopted with advantage. Where practicable, draining tiles may be manufactured by the landlord, and given to the tenants, without incurring a heavy outlay. In such cases, however, the drainage should be effected under the immediate superintendence of the agent, or some competent person selected by him. The construction of a tank to prevent the liquid manure from running to waste, and the spouting the buildings to prevent injury to the manure and too much dilution to the liquid part, may be executed at a small expense. In such cases, I should suggest the absorption of the manure by the dungheap, or the mixture of some dry material with it, as a preferable mode to applying it in a liquid form. The construction of a single road will frequently afford material assistance, by reducing the cost of horse-labour in bringing in the crop, and carting out manure. By the judicious arrangement of an experienced hand, a road may frequently be made, if materials are at hand, at a very moderate expense. I have before remarked that I consider, "in the present emergency," landed proprietors are called upon to make sacrifices where they are needed; and I know of none which can be more easily, effectively, and philanthropically made than the discontinuance of the costly, obnoxious, and demoralizing system of game-preserving. I have been furnished with a statement by which it is clearly shown that, upon an estate the rental of which is £5,000 per annum, the cost of gamekeepers, with the necessary appurtenances, allowance to tenants for the destruction caused by the game, and a very moderate allowance for injury done for which compensation was never made, amounted to upwards of 20 per cent. upon the income. Is it too much, under existing circumstances, that a landlord should be called upon, for his own benefit and that of his tenantry, to forego an indulgence of which the costly part to himself is the least objectionable, and which tends to increase, by its encouragement of poaching, the poor and county-rates imposed on the district? I am aware that these suggestions may be regarded as trifling expedients, and may excite a smile on the countenances of farmers conducting their business on an extensive scale, who keep pace with the times in improvements—who procure the best stock, and provide the best implements; but it must be borne in mind that there is a great extent of land occupied by farmers who are not in such a position either as regards capital or intelligence.

Mr. Ambrose said he rose, as a practical man, to ask for some explanation. Mr. Shaw had stated that draining might be performed with Fowler's plough for 30s. an acre. He wished to know whether that sum included the filling up. In his own case the tiles alone had cost 45s. per acre.

Mr. Beadel thought he could give the explanation required. The amount stated by Mr. Shaw was perfectly correct; when Fowler's plough was used on strong clay land.

Mr. Walton wished to make a few observations. He entirely agreed with Mr. Shaw that it was necessary that as much as possible should be done to improve the position of the tenant-farmer. In considering this subject it was necessary to take a retrospective view. He believed that many landlords who had left their estates in a dilapidated condition had positively received as good rents as they might have expected had the case been otherwise. He knew many estates on which not a shilling had been laid out for thirty or forty years, and he was himself on an estate of that kind at that moment. Landlords had received protection-prices without having made any proportionate outlay. At the commencement of 1851 Lord Derby said there was no hope or chance of a return to protection, and at the same time he observed that there had been an increase of £5,000,000 a-year in rentals, owing to the outlay which landlords had made on their estates. Now he (Mr. Walton) al-

together denied what his lordship asserted. He maintained that not one landlord in fifty had expended one per cent. By far the greater part of the burden of improvement had fallen on the tenantry, and even those landlords who were called scientific men generally received five per cent. upon their outlay. As a tenant-farmer of twenty-six years' standing he asserted that nearly the whole of the improvements which had taken place during that period had been made with the floating capital of the tenantry. Nine-tenths of the farms of England were at that moment untenantable owing to the bad condition of the buildings. He quite agreed with Mr. Shaw, that it was necessary that landlords should take care to have first-rate practical men to manage their estates; and if they neglected to do so, they must not be allowed to throw the odium of bad management on their tenants. As to draining, he was of opinion that, notwithstanding free-trade, the tenantry had still capital enough to effect a great deal of improvement, provided they had sufficient security. During the last three years more money had been expended by the tenantry of England than in ten times the period previously. With respect to free-trade, he thought the Duke of Newcastle was right in declaring it to be a landlord's question; and it rested with landlords, in a great degree, to say whether the tenantry of England should prosper or not.

Mr. Aicheson anticipated great benefit from the discussion of that evening. Mr. Shaw had brought forward many topics which could scarcely be introduced too often, for it was only by reiteration that they could hope to gain their object. He must confess, however, that some of the observations of the last speaker seemed to him rather astounding. (Hear, hear). If the landlord was to pay for everything, how was he to get any return from his property and to support his family? (Hear, hear). He thought there was a medium between the two extremes. When estates were well managed, there could be no difficulty in arranging draining, and everything else in the way of improvement, on the principle of enabling the tenant to take proper care of himself under his agreement. (Hear, hear). He had let large tracts of land; and when a tenant had come to him to ask for tiles or other materials, he had said, "Now, which would you prefer—to leave me to make the improvements and pay a per-centage, or to make them yourself, and at the end of your term to have a just allowance for what you have invested?" Now, he contended that the fault mentioned by the preceding speaker did not rest altogether with the landlords: it was shared in by tenants who rushed into the occupation of land without having obtained proper agreements (Hear, hear). Under such circumstances, the tenant said to the landlord, "You must do this and that;" and the landlord very naturally replied, "I gave £30,000 for my estate, and though I do not expect to get 5 per cent., I certainly do expect to obtain 2½ as a return." As regarded land agents, he did not mean to assert that they were all honest and straightforward men; but he certainly did not believe that many of them would advise a tenant farmer to sink his capital merely for the purpose of aggrandizing his employer. In truth, the question was not a landlord's question alone; they must look at both sides (Hear, hear). He was one of the oldest members of that club, and had always been of opinion that it was desirable to lay down a scale with respect to unredeemed improvements: he had always thought that the tenant quitting his occupation should have so much at the end of three years, so much at the end of four, and so on, for actual improvements which he had made; and that at the end of a certain period he should be held to have received sufficient compensation for his outlay (Hear, hear).

Mr. Bennett, on rising, said he would not detain the meeting at any length, although if his friend, Mr. Shaw, should succeed at the present juncture in proposing a system of relief to agriculture, it would be a most valuable boon; and he was free to admit that the suggestions he had made, as far as they were applicable to the state of the country, were doubtless very useful. But he must say that he thought Mr. Shaw, in introducing the subject, had fallen into the too general error that wide, crooked, and wasteful hedge-rows, studded with useless timber and old pollards, were the rule, and not the exception, in the country. Wherever these nuisances—for he must call them so—were still found, they were doubtless a great discouragement to agriculture; and to remove them, and replace them with a few nice, neat, straight hedges, was most desirable. But he (Mr. Bennett) thought that a person could not be very observant of what had been going on for the last twenty years not to have perceived to what extent these improvements had been already effected (cheers). In several counties, he knew well, scarcely any such barbarous old fences were now to be found, and in others they were certainly the exception; so that it seemed to him to be rather begging the question, to regard such a proposition as a novel or untried improvement. The breaking up of poor grass land, under certain limitations, was very desirable; this, also, had been practised very extensively of late years. But even this hobby might be ridden too hard, more especially while wheat ranged at present and late prices. Such land, for the most part, in its present state, bore some rent, and with scarcely any cost yielded about the same amount of profit to the occupier. Whereas, if the soil were a poor tenacious clay, they might succeed in raising a few crops while the turf was left; but that gone, they had a poor, intractable, exhausted soil to contend with, and, with wheat at or under 5s. the bushel, ruinous for the tenant to farm, and incapable of yielding scarcely any rent to the owner. He (Mr. Bennett) would not deny, however, that by selecting the more unprofitable tracts of grass land, where the soil, when ploughed, was convertible, and would, by the application of labour and capital, bear good root crops—such land was doubtless far more profitable under tillage. But what he contended for was that this is no new discovery. Our more intelligent and skilful farmers had long been directing attention to these points, aided, as they have been, in many cases, by landlords requiring less stringent covenants as to the mode of farming. He would be glad to see the encouragement general. These improvements doubtless admitted of extension; but if this

subject was introduced as a panacea for the cure of the ills inflicted on British agriculture by recent legislation—as the term, "in the present emergency," seemed somewhat to indicate—he (Mr. Bennett) would be no party in propagating such an illusion, the more so as these improvements were now inapplicable pretty well to nine-tenths of the country as they now saw it (Hear, hear). It was proper enough that landlords should lend a helping hand by every possible means to enable the tenantry to grapple with their difficulties; many landlords, however, had not the means of doing so to any sufficient extent. To render the tenant assistance in providing steam-thrashing machines was no bad suggestion; but Mr. Shaw had surely stated the savings beyond the ordinary cost at far too much, when he made it 10s. per acre. If they took the article of wheat, and took it at four qrs. per acre, at 2s. 6d. per qr. under the old system, the entire cost was but 10s.; while, if the steam-engine were even provided gratis, they could hardly work it and keep it in repair for nothing; so that their friend (Mr. Shaw)—though not intentionally—had stated his case too strongly as to the extent to which tenants might be relieved in this way. There could be no question but what covered homestalls were a great benefit; but he could not go the whole length with Mr. Shaw and others, when they represented that these may be erected at the mere cost of one year's rent (Hear, hear); or if so, such homestalls must be of the most temporary kind. Far be it from him, however, to deny that by the mutual co-operation of landlord and tenant much might be effected; but he had a very strong objection to statements emanating from that Club which might appear extravagant or impracticable; he entirely acquitted Mr. Shaw of intentionally doing so. He (Mr. Bennett) could not, however take his seat without demurring much more strongly to many of the observations which had fallen from the gentleman just sat down. There were, doubtless, ungenerous and arbitrary landlords, as well as men of that character among all other classes of society. But when Mr. Walton represented the land of the country as having been improved by the tenantry some two or three hundred per cent., and they (the landlords) pocketing the whole, while they had contributed nothing towards those improvements, he for one had no sympathy with such statements, they were ill-adapted to strengthen the bond of union between landlord and tenant, and thereby promote the general improvement of agriculture, the object for which that Club, he believed, had been mainly established (cheers).

Mr. Beadel did not think it came within the limits of the objects of that Club to abuse either landlords on the one side, or tenants on the other (Hear, hear); and he hoped that in future, whatever might be their private feelings, members would abstain from making remarks like those which had been so justly commented upon by Mr. Bennett (Hear, hear). Mr. Bennett had objected to Mr. Shaw's remarks on the subject of hedge-rows and other similar obstructions to cultivation. Mr. Shaw had, he thought, very properly avoided entering into detail; but, if any gentleman who doubted the existence of examples of what was described, let him go into Kent or Surrey, and he would soon find some (Hear, hear). The remarks of Mr. Shaw on that subject might not be applicable to Cambridgeshire, but they were nevertheless to be applied according to the varying circumstances of the country. Again, Mr. Bennett had called in question the accuracy of Mr. Shaw's statement, that a covered homestall could be erected for one year's rent. Now, it happened that he (Mr. Beadel) had had a good deal to do with the erection of covered homestalls; and he had no hesitation in telling Mr. Bennett that he could have erected a covered homestall, sufficient for the accommodation of from twenty to thirty beasts, at an expense of from two to three hundred pounds. That remark was not applicable to a farm of 40 or 50 acres. He took as the basis of his calculations the average extent of the occupations throughout the country (Hear, hear). He did not know any better means by which a tenant could be assisted. Not only did it lessen the consumption of food, not only did it put the animal in an improved position for fattening, but it also enabled the tenant to make the best of his manure, so that eight loads would, as experience proved, supply the place of sixteen under other circumstances. By means of covered yards, dung was made in the most complete manner, and was always kept in the best possible state for being put on the land. As regarded the question of improvements, he must say that many tenants expected landlords to do all, and were unwilling to do anything themselves (Hear, hear). In repeated instances, when a tenant had come to him asking for improved buildings, drainage, and other improvements, he had tested him with this simple question, "What are you willing to give in consideration of these improvements being made?" and in the majority of cases the tenant had expected the improvements to be carried out without his undertaking to give anything at all to compensate the landlord in his outlay (Hear, hear). He could not regard the landlord and tenant of a farm as holding a different relative situation from the landlord and tenant of a house. If a tenant chose to take land without considering the obligations and risks which he thereby incurred, or without being prepared with the capital necessary for its cultivation, the blame of that ought not to be visited upon the landlord. He had often heard it said that the sole object of landlords was to obtain tenants who would give them the greatest amount of rent, without caring to enquire whether or not they had sufficient capital to cultivate the farm. Now he begged to say that his experience did not bear out that statement. At the same time, if tenant farmers generally would set their faces against land being let to men who had not capital enough to farm it, he was satisfied that that would do a great deal of good (Hear, hear). Having some knowledge of practical farming, he did not recollect a single suggestion in Mr. Shaw's address which might not be carried into practice. There were a variety of instances in which landlords might relieve their tenants without any material outlay; various means had been suggested by which that might be done; and he was quite convinced that landlords generally would be

found ready to do their duty if tenants would do theirs.

Mr. WALTON said—Having been attacked by three gentlemen for the remarks which he had made on landlords, he begged to say that he did not wish to retract one word that he had uttered. He believed that many landlords were annually receiving two or three hundred per cent.; and if they reduced their rentals one-half they would do but little to extend to their tenants compensation for what they had lost.

Mr. SIDNEY said the position which he occupied in that room was that of one who came to learn, and not to teach, and he certainly had had the advantage of becoming acquainted there with many important facts. Now, having had various opportunities of witnessing the skill, the industry, the energy, and the perseverance, which tenant farmers brought to bear on the cultivation of the land, he had often wondered at the very small influence which, as a class, they exercised in the state in comparison with other interests, which were certainly not more wealthy, not more intelligent, not more energetic. But he thought he had discovered, after attending a few meetings of the club, why it was that tenant-farmers exercised so little influence in the country; it was because when a third party was concerned they went to all points of the compass, and applied for assistance in all quarters except that in which it could be obtained. Now, for example, Mr. Shaw had that evening mentioned certain difficulties in the way of good cultivation, and had pointed out means by which they might be removed; and for doing that he had been exposed to a good deal of criticism, because parties were unwilling to admit that they had anything to learn. Mr. Bennett had asserted, in a very positive manner, that from one end of the country to the other it was quite unusual to meet with crooked hedges and fences. Now it was not necessary to be a farmer in order to pronounce an opinion on that point. He (Mr. Sidney) happened to have hunted in about ten English counties; and he must remark, that if Mr. Bennett would but cast his eyes towards Northamptonshire and some parts of Cheshire, or if he went down to Devonshire and Somersetshire, he would find an extensive crop of such objects (Hear, hear). It almost invariably happened, however, that when an evil was pointed out which required the efforts of the tenant-farmers for its removal, up rose two or three persons to deny its existence, or at least to declare that it was very partial in extent. He was surprised to hear Mr. Bennett speak as he had done of the old baronial lords and squires; for his own part, agreeing with preceding speakers, that landlords as a class were not worse than any other class, he also thought that among old landlords and new ones were to found the same differences of character. Take, for example, the case of the Middleton estate, now in the hands of Mr. Peto, member for Norwich. As long as that estate remained in the hands of the old baron it was undrained; and there were tumble-down buildings upon it, which were never repaired, the rule being, when the tenant asked for repairs, to offer him a reduction of rent. The estate passed into the hands of Mr. Peto, a gentleman who had plenty of money (he did not believe him to be any better than other people), who was a business-like man, and he proceeded to put it in good order. There were three things which appeared to him especially necessary for tenants: first, that they should know their rights; secondly, that they should be disposed to maintain them; thirdly, that they should have landlords who had sufficient money and intelligence to effect improvements. They would never get what they required so long as they adhered to the old principle of considering everything that was done by the landlord a concession and a favour. If tenant-farmers placed themselves in the same position as other kinds of tenants they would have similar advantages. He was afraid that as yet nine-tenths of the landlords knew scarcely anything about agriculture. Their intentions were good, perhaps; but whenever a question was put to them about a farm, they referred the matter to their agent; and the result was often anything but what could be desired. Farmers had too often to deal with those who had no sympathy with them. The landlord had very frequently no idea how the farmer got his living (Hear, hear, hear); how he managed to pay his rent, and what return he was able to obtain for his skill and outlay. He regretted to see such landlords selected by farmers as their representatives, when a man like Mr. Pusey, whose life had been devoted to agriculture, was made the drunkard's song.

Mr. TRETHEWY said, he had not intended to make any observations that evening, but the discussion had taken such a turn, that he could not refrain from saying a few words. It appeared to him that the thing resolved itself into a small compass. He did not see any difference in principle between a tenant-farmer taking a farm of a landlord, and any other kind of tenant making a bargain with his landlord. There must always be two to a bargain; although they had been told, in effect, that evening, that the tenant was obliged to accept whatever terms the landlord chose to dictate. As an agent, he could bear testimony not only to the willingness of landlords to encourage improvement, but to their practical knowledge; and he was not disposed to join in the general outcry against them. He agreed, too, with Mr. Bennett, that the older landlords—he meant men who had inherited estates from their ancestors—would generally be found more liberal with their tenants than men who had bought land recently as an investment. Any person who had had much experience on the subject would bear him out in that view (Hear, hear).

Mr. SHAW replied: As Mr. Bennett had left the room, he would make only one remark in reference to that gentleman's observations on the subject of hedge-row timber. It would be in the recollection of the meeting that he (Mr. S.) pointedly drew a line of distinction between those estates, and consequently between those parts of the country which had been well farmed and well managed and those which had not; and that he also said that his observations were mainly applied to persons and to farms which were backward as regarded the management and cultivation of land, compared with the intelligence and energy displayed in other parts of the country. He was not

so absurd, nor had he so little personal knowledge of different districts, as to advise that hedgerows should be removed in Wiltshire or Cambridgeshire; but he thought that if they traversed the kingdom from north to south, and compared the estates which were well managed with those which were ill managed, they would find abundant room for improvement in that respect. (Hear, hear.) He was glad to find Mr. Beadel confirming his statement with regard to Fowler's plough. He had made it on the authority of a practical man; and he had said nothing to induce any one to suppose that he referred to tile draining as ordinarily practised. To show the permanency of this mode of draining, he would mention to the meeting a circumstance which had occurred recently. A very short time ago his friend Mr. Hobbs and himself, together with some other parties, went down to Gloucester, for the purpose of selecting the site for the Royal Agricultural Society's Show in the ensuing year; and a field was shown them, which although they did not think it sufficiently drained for the purpose contemplated, namely, the show-yard, yet upon opening one of the drains, which had been made ten years previously, with a mole plough it was found to be in a most perfect state. The landlord who had an estate, and wanting capital had not that interest in the estate which would enable him to raise money upon it for the purpose of improvement, was situated just as other men were, and had to encounter just the same difficulties as those who were hampered for want of capital in any other pursuit, and he must adopt the most available expedients to extricate himself. An observation had been made with reference to the price of thrashing, to which he (Mr. Shaw) also desired to advert for one moment. Now, generally speaking, when a man wished to make his case pretty strong, he was apt to give himself the advantage of something above what would be the average state of things; and in the present instance he felt that 2s., which had been stated as the price for thrashing wheat, was not a fair average (dissent). True, it might be at the present moment; but he believed it would not be affirmed that, a few years ago, taking the country through, wheat could ordinarily be thrashed at 2s. a quarter. ("No," and "Yes.")

Mr. Trethewy: Four shillings would be nearer the figure.

Mr. Shaw: What he had stated was on the authority of as practical a man as any in the room. And supposing 3s. to have been paid, which was no uncommon price, then he concluded that by the use of a steam thrashing-machine it was perfectly clear that when the produce of wheat was 5 qrs. an acre, 10s. an acre might be saved. Nay, if any confidence were to be placed in the statements of persons who had given a great deal of attention to the use and effect of machinery, he might go further. A fixed machine was in some measure different from a portable machine; but he had seen a machine in Gloucestershire, by the use of which he was assured the wheat might be taken in from the stack-yard, and the whole process completed at a cost of not more than 9d. a quarter. Then, again, if he referred to the most recent account which had been given of the saving to be effected by means of steam in thrashing, he found it in an excellent article by Mr. Pusey, which appeared in the "Journal of the Royal Agricultural Society," and which stated the price even lower than that—he believed about 7d. or 8d. per qr. If that were so, then he did not think he had exceeded the mark in the figures he had laid before the Club; and though in some respects that had arisen which he had anticipated, viz., that his statement of details had not carried conviction home to the minds of all, nevertheless he was glad to believe, from the observations of his friend, Mr. Beadel—a very competent judge—that he had in some measure attained the end he had in view—that of pointing out the particular objects to which the attention of landlords should be directed in the work of assisting their tenantry to effect improvements. Even though his only success had been to have his statements objected to, and perhaps refuted, still that would be useful, because he felt himself to be somewhat in the position of the author who, when his book was sent to be reviewed, and no notice was taken of it, exclaimed, "Pray give it a review. If you cannot do anything else, abuse it." He should be satisfied, therefore, if he had only succeeded in fixing attention on this important subject (Hear, hear), and showing that there were very many things which the landlord might do in particular localities, "without involving any considerable outlay of capital," where the tenants were men of neither sufficient capital nor sufficient intelligence to keep pace with the times. He well knew that in the neighbourhood where he used to reside, if a man wanted a colt or a calf, it mattered not to him what was the breed of the horse or bull to which the mare or cow was sent. The sole question was as between a half-crown and a half-guinea, or any larger sum, and generally the half-crown carried it (a laugh). Even in that respect he thought the landlord might render valuable assistance to his tenantry by keeping male animals for their use, and so improving their breed of stock. In conclusion, Mr. Shaw proposed the following resolution .—"That, although improvements on land cannot be so speedily, effectively, and economically carried out where ample capital is not at command, nevertheless great improvements may be made by the co-operation of landlord and tenant 'without involving a considerable outlay of capital,' provided compensation for unexhausted improvements be secured to the tenant."

Mr. Aitcheson seconded the resolution.

Mr. Trethewy, being of opinion that the nature of the aid to be given by the landlord should be more definitely expressed, submitted that the resolution would be in a more preferable form if it stood thus: "That it is in the power of landlords, without any great outlay of capital, to afford some relief to their tenantry by allowing old hedge-rows to be grubbed up and inferior grass-lands to be ploughed, and by giving compensation to their tenants for unexhausted improvements, upon a scale which should be set forth in the agreement."

The Chairman (Mr. Hobbs) said there could be no doubt that the great difficulty in farming in the present day was want of capital. In many cases neither tenant nor landlord had capital at command; but it had been

suggested to-night that there were means of obtaining the capital required by going to a Drainage Company. Other points had been mentioned also, in which the landlord might assist his tenantry, and these were—Fowler's plough, guano, cattle-boxes, thrashing by steam-power, stallions, bulls, and boars; but Mr. Trethewy had omitted all these from his resolution, which he confined simply to grubbing-up all hedge-rows and ploughing inferior grass lands; in fact, he did not attempt to embrace any wider question than was included in the question of tenant-right. Now he (Mr. Hobbs) was of opinion that the subject of discussion was of a more comprehensive nature than tenant-right, and might be shown to embrace every description of improvement to be made in agriculture. Last week he was down in Herefordshire, and while there visited Lord Somers's estate, upon which that noble lord had introduced two steam-engines, with thrashing-machines and mills. These were for the use of the tenants of from 2,000 to 3,000 acres of land; and by charging the tenants £50 a-year for them he was enabled to pay the interest upon the capital employed, and the cost of the wear and tear: at the same time that he did this, he saved the tenantry ten per cent. upon their rental, or nearly that amount, according to their own calculation. Now that was one point in which the landlords, by a small outlay of capital, might benefit their tenants to a great degree, and this without injury to themselves. Again, in breeding districts, if they introduced a good breed of stallions, bulls, and boars, very considerable advantage would also result, from the improvement which would then necessarily take place in the stock. These were points which landlords ought not to overlook. (Hear, hear.) With regard to the Drainage Society, of which he (Mr. Hobbs) was a director, he was happy to say that they were doing a vast deal of business with landlords who had no capital at command, or were possessed of a life interest only in an estate. They entered into arrangements with the society, who thereupon erected new buildings and made new roads for them. Upon one estate alone, at that moment, the society were constructing new roads, which would cost upwards of £1,200. They were also engaged in the drainage of estates; and he had little doubt that in the course of time both landlords and farmers would find it generally advantageous to employ such companies as that. As Mr. Shaw had justly observed, he thought these companies were not yet sufficiently known; but when they became known, he was certain they would be appreciated.

Mr. W. Bennett objected to Mr. Trethewy's proposition that it would be partial in its operation, and apply only to certain districts. He admitted that in those districts it might be beneficially carried out, but he could not consent to its going forth to the country that the club entertained the opinion that that would prove an effectual means of relief to the farming interest.

Mr. Trethewy having consented to withdraw his proposal, the resolution of Mr. Shaw was then agreed to unanimously, and the meeting separated.

ON TURNIP CULTURE.

BY A PRACTICAL FARMER.

> In May, at the furthest, twifallow thy land,
> Much drought may else after cause plough for to stand;
> This tilth being done, ye have passed the worst;
> Then after who plougheth, plow thou with the first!
>
> Tusser.

Tusser was an advocate for early fallowing—he wrote about 300 years ago. We think with him, that a good "tilth being done" in May, the worst is passed, and we have the season in hand. We can then await the proper time for sowing, and any favourable change in weather, or progress in our farm business, and adopt our course accordingly. In making our observations on Turnip Culture, we shall decline remarking upon the preparation of the soil to any extent, having recently done so in our papers upon the Culture of Potatoes and Mangold Wurzel and on Fallows. We will, however, in passing, observe, that it is imperatively necessary to profitable turnip culture, that as fine a tilth as possible be obtained, and that every expedition be pursued in getting in the seed, so soon as the season and the circumstances of the farm lead to a desirable commencement.

Turnip Soils.—Turnips will grow advantageously upon all properly-prepared soils. Clay soils will produce good common turnips, under suitable culture; and, under careful and judicious management, they may be fed from these soils with profit to the farmer. We have frequently done it ourselves, and chiefly by the aid of sheep-shelters, well bedded with stubble. It makes good lairage, and also good manure. In this way we often make from 200 to 300 loads of valuable manure in wet or precarious seasons; but, in fine, dry winters, like the last, these prepared lairs are quite unnecessary. We commend a trial to clay land farmers.

The best turnip soils are all those having an open tendency from the richest loams downwards; but we scarcely know any variety of soil not calculated to produce a turnip crop of one kind or another; or, we again repeat, that may not profitably be fed off from such soils, under proper care and management. The great difficulty to be provided against is, dry and healthy lairage for the sheep. The worst of these soils, we think, may be readily prepared for future cropping by adopting suitable modes of culture. Early feeding off, and winter ploughing *(any subsoil drained land)*, will nearly suffice for the most adhesive clays; and the exposure to frosts and other aërial influences will, for the most part, correct the bad effects of trampling or treading done by the sheep on every soil; at any rate, a little extra culture and fallow-working bestowed upon the land in the spring will more than counterbalance the injury thus sustained.

Varieties of Turnips.—The varieties or kinds and subvarieties of turnips are almost beyond belief, to such a gratifying extent has its cultivation and improvement arrived. We, however, think that they may be classed under three or, at most, four distinct kinds—*i. e.*, the Swedish Turnip, the Common Turnip, the Hybrid Turnip, and the Tankard Turnip. We have before us the names and professed qualities of many varieties, extending in description far beyond the length to which we intend to limit this paper. We cannot even enumerate their names, and shall therefore merely confine ourselves to a very short notice of those kinds we have cultivated on our own occupation —Swedish turnips.

Skirving's Purple-top Swede is a large free-growing sort, of irregular form, rather too long necked, but of good quality, and peculiarly well adapted for culture on thin turnip soils, and land of inferior quality. For these it is almost invaluable; but on rich loams, or land highly manured, it grows too coarse, and, we think, loses in quality of flesh. A capital sort!!!

Matson's Purple-top Swede.—This is a very good variety, and most of excellent quality; it is well-formed, growing deep in the ground, with but little neck and not much leaf, and is very hardy. It is best suited for good turnip lands. A very good sort!!

Clarke's Purple-top.—This is a kind obtained from the preceding two, and combines the quality and hardiness, and beauty of the latter, with much of the size and substance of the former. It was crossed in the first instance by planting the finest bulbs of both varieties in *squares;* the *corners* being *Matson's* variety, and one large *Skirving's* in the *middle;* subsequently, and for several years, the finest bulbs partaking most of the combined qualities in proportion as named, have been planted; and from this a fine stock has been produced. We do not know a better!!!

Laing's Purple-top Swede—This is a beautiful variety in appearance, and is readily distinguished by its peculiar or brocoli-shaped leaf hanging over a small well-shaped turnip. We cannot, however, recommend its cultivation even on the best soils: it does not produce a crop of sufficient weight.

Hillyard's Thorpeland Swede. — We grew a small screed of this variety some years since, but found it so dwarfish in size and unproductive as to cause us to abandon its growth at once.

Matson's Green-top Swede.—We have grown two varieties under this name; the one, a very beautifully-shaped little bulb, of first-rate quality, with a very short neck and moderate quantity of leaves. (We never saw a finer crop, to all appearance, than was obtained some years since from this variety. It was sold, in lots, by auction, to be consumed on the land, and realized from £11 to £12 per acre). The other was a much coarser sort, but still of very good quality, and preferable for general cultivation—being quite as hardy, and producing a much heavier crop. A truly good variety!!!

We have also at different periods tried many plots of the new and popular varieties of swedes—both purple and green-top—as they were brought before the public by various parties; and amongst them many from our decidedly popular seedsmen. But from our own experience, and also observation, (and we have paid much attention to this point in business), we should deem it wrong to recommend any particular variety by name: we would only say, choose from a good stock, and in accordance with the richness and value of the soil to be sown. For thin soils, the freest and largest variety known; and for fair turnip lands, any well-approved sort of hardy nature and bulky growth.

The Common Turnip.—By the common turnip we mean all those kinds possessing a white flesh and the common globular form. These we have grown under names peculiar to the parties producing them; and much credit is due to parties whose names we might introduce, for the care they take in their selection and growth; but we can here only deal with the varieties. We have grown in our ordinary farm practice the Red Round, Green Round, White Globe, White Stone, and many, as we think, subvarieties of the same kinds—as the Pomeranian Globe, the Norfolk Sugar-loaf, the Stubble Turnip, the Green Globe, &c., &c., &c.: many produced by parties whose names they bear.

The Red Round Turnip.—This variety is chiefly distinguished by its pinky purple rind, or rather that portion of the rind growing above ground; that portion in the ground being white. It grows deeply into the soil, is of a fine globular shape, and the quality of flesh firm and sweet. According to our experience, it is the most hardy of the common varieties, and best suited to good turnip lands; we are almost inclined to say the only common sort well suited to rich loams.

The Green Round Turnip.—This is very similar to the above. Its colour is green instead of pink; it is of somewhat larger growth, stands more out of the ground; it is preferred on the medium turnip soils to the Red Round. We think it is not so hardy nor so firm and sweet fleshed.

The White Globe.—This variety possesses a white rind, is of large globular shape, grows more freely than either of the above sorts; its flesh is not so firm, but it will produce a large crop, and of course is better adapted to poor soils; on rich loams it grows too fast, and becomes "fuzzy" and worthless.

The White Stone.—This is one of the smaller, or garden, varieties, brought into field culture. It is not very productive, but is very sweet and hardy; it has a white rind, and in its growth buries itself deeply into the soil. This sort is the best adapted for late sowing of any of the common varieties; and the same, we think, known as the Stubble Turnip.

We have cultivated in plots many common sorts under various names, but the chief distinctive qualities and kinds are the four named above. Of others, some vary a little in shape, some in size, some in shade of colour; some bury themselves deeply in the soil, others more on the surface; some, again, grow very fast, and yield a large bulb and pithy flesh; others slowly, and yield a small bulb and firm flesh, and so on, for these minor distinctions are very numerous,

and ofter well worth the grower's attention, as in the course of business he may frequently have to choose his kind for sowing according to the state or progress he has made in preparation for his turnip crop, and the time he is enabled to get it in.

The Hybrid Turnip.—In this class of varieties we include all those sorts which have APPARENTLY been produced by crossing, although we are not conversant with the fact. We name amongst them all the yellow fleshed kind with the rough leaf. Amongst these we have grown the Green-top Scotch Yellow, the Red-top or Aberdeen Yellow, Dale's Hybrid Yellow, Ox-heart Yellow, and plots of others under various names, as Hanoverian Yellow Globe, Gordon's Yellow Bullock, Skirving's Yellow Bullock, and others; the distinctive qualities being the same in kind as those just named in the white sorts.

The Green-top Scotch Yellow.—It grows to a large size, is well formed, though not a perfect globe, being rather flat at top, very little neck, and not too much leaf. Its flesh is firm and good, and it will retain its quality through a winter of medium severity. It excels the Aberdeen Yellow in weight of crops.

The Aberdeen Yellow.—This has a red or purple rind. It is similar to the Green-top Yellow in growth, but not so productive; it is, however, more hardy, and will generally abide a severe winter, burying itself deeply in the ground, and the tops being rather abundant fall over the bulb and aid in its preservation.

Dale's Hybrid Turnip.—This has a green rind, and is a known cross between the Green-top Swede and White Globe. It is a free-growing variety, and may be sown late in the season; it is rather variable in shape and has much foliage. It is said to be hardy, but we think not equal to the Aberdeen Yellow.

Ox-heart Yellow.—This is a good variety, but requires to be consumed early in the winter. It grows fast and attains great weight, but is not quite so hardy as those already named.

Hanoverian Turnip.—A large size, growing high out of the ground; not hardy enough to stand a severe winter, but very productive.

Yellow Globe.—This is rather a small sort, and grows deeply in the ground, consequently hardy; it has a light green rind, and leaves small and spreading.

Gordon's Yellow Bullock.—This is one of the best and hardiest of the yellow-fleshed varieties, and a known crop between the Swede and Aberdeen Yellow.

Skirving's Yellow Bullock.—This is a very good turnip, and an improvement upon the Aberdeen Yellow, which it much resembles.

The Tankard Turnip.—We have made a class of this sort, and we think properly so, as they are so distinctive in their characteristics, the growth and form being dissimilar to the other varieties, and they must be brought into consumption before winter. We have grown the Green and Yellow Tankard, and the White and Green Tankard Turnips. Their growth is so similar that we shall place them together; the two first named are yellow-fleshed varieties, and the latter are white-fleshed kinds. They all grow in form like a "tankard," and much out of the ground; they produce very heavy crops, and are well adapted for late sowing and early consumption. The yellow sorts are the most hardy, but neither is hardy enough to bear severe frosts: their great value lies in their early maturity and abundant produce. We highly recommend their cultivation on turnip lands intended for wheat in the following year, or on rich loams for a similar purpose when the sowing is of necessity late. We think a crop of this variety might often be obtained to advantage in place of dead or bare fallow; it would require to be got in early, and then be eaten off for wheat, leaving a large deposit of manure as made by the sheep in feeding it off, besides the profit on the sheep.

CULTIVATION.—We have, in our papers on potatoes, mangolds, and fallows, said so much upon the preparation of the soil as to render any observations on that head superfluous now: we therefore take the land as being properly fallowed and made quite ready to receive the seed, and for *Swedish Turnips* we take it to be neatly ridged at twenty-five inches apart, and manured with about fourteen two-horse loads of good fold-yard manure, all rolled down ready for drilling. We therefore (in this paper) commence with drilling Swedes. We invariably drill in with the seed some artificial manure or compost; the cheapest, and that most commonly used by us, is about two bushels of decomposed night-soil mixed with twelve bushels of loamy soil, and about forty bushels of ashes burnt from twitch, roots, sods, turf, or other available vegetable matters that we can convert into ashes; these we drill in with the seed, and the rapidity with which this compost forces the young turnip plant "out of harm's way" is both surprising and satisfactory. The night-soil is best mixed with loam a year or more previous to its being required for use: we aid the mixture by adding strong manure from the piggeries, the dove-cot, and cess-pools, &c., &c. We next prefer a mixture made from dissolved bones at the rate of four bushels per acre, and fifty bushels of ashes. Our next application as to preference is the application of about two-and-a-half cwt. of guano with the above quantity of ashes; this application we drill in with double spouts or coulters. Guano must not come into contact with the seed in the act of germinating; if it does, it is sure to die! We have also used bone-dust, rape-cake, British guano (well made), nitrate of soda, urate, &c., &c., and with good effect. Almost any fertilizing matter thus applied will produce most satisfactory results. We do not know of any plan for preventing the ravages of the turnip-fly so good, or so certain in its success, as to drill in with the seed some fertilizing substance, taking great care that it be not too strong, rancid, or acrid, in its nature; germinating seeds cannot withstand such contact, but if the application is judiciously made, the growth of the plant is not only greatly promoted, but the vegetation of the seed itself is quickened, and possibly the plant also may, by these kind of applications, be rendered distasteful to these little voracious insects, and in this way prevent injury. The quantities we drill in is from four to five

pounds of turnip seed, and from forty-five to seventy bushels of compost and ashes per acre.

Common Turnips.—The common turnip we prefer putting in at the latter end of June, and "upon the flat," not upon ridges; common turnips sown on ridges grow much too fast, and become very large and "fuzzy," or dry and pithy. In late sowings we should not object sowing them upon ridges provided they can be consumed before the winter's frosts attack them: they are, however, much the best upon level, well prepared soil; they can bury themselves deeply in the soil, and being less exposed keep their quality much better, and are much more easily preserved for winter use. We drill about four pounds of seed to the acre at twelve-inch intervals, and about sixty bushels of compost and ashes; the land is rolled down prior to drilling, and in this case, as also in drilling swedes, we leave the drills open provided the weather is wet and genial, but if it is dry and unpromising we again roll all down closely.

Subsequent Management.—This will consist in repeated horse-hoeings and harrowings done to the swedes, and recommended for mangolds, and in hand-hoeings, weeding, and singling, done to both swedes and common turnips. We prefer setting out the turnips with an eleven-inch hoe. In ridge work we would refer our readers to our description of these hoeings, &c., given in our paper on mangolds. In setting out our common turnips we use a twelve-inch hoe on account of our rows being drilled at narrow intervals. We first broad-hoe them as soon as they are fairly up, that is, to hoe the land without meddling with the plants. We do this not only with a view to cleanliness, but to promote the more rapid growth of the plants. In a few days we proceed to set them out. The hoers take one row each, and bending down and taking short hold of the hoe, strike or chop as regularly as possible along the row, leaving, if possible, but one good plant between each stroke. Each hoer is followed by a lad if the plants are large enough for singling, to weed and single them out; or it may be desirable to wait a few days to allow time for large growth, and the disturbed plant to obtain a more secure hold, or many will be drawn up inadvertently by the lads. Turnips should be repeatedly hoed; nothing tends more to enhance their growth. Those on the ridges may be horse-hoed or ridge-harrowed, so long as a horse can get down the rows without doing serious injury to the plants; and those on the level soil or flat will amply repay for hoeing, so long as it is possible to draw a hoe amongst them. We are careful not to go amongst them in wet or unfavourable weather; to avoid this it will be requisite to have plenty of help at hand, and at every suitable time to make use of it with all the hands that can be spared. Should any thin places occur in the crop, it is far preferable to fill them up with rape or cabbage than to transplant turnips.

On ridges where much manure is used, a partial vacuum will occasionally be found by the decay of the manure. The roll in this case should again be passed over them, and no heed or fear need arise respecting the plants if the time of rolling is properly chosen, which should be just immediately before setting out, or when they are about four inches in height. The subsoil and surface-soil being thus brought more closely into contact, moisture is drawn from the soil, and the plants improve faster than before. This we have often proved in dry weather, and it is good practice on all lands heavily manured. On all rich loams it is best to wait till the middle of June before sowing swedes, as they are very liable to catch mildew, but on all meadow soils the sowing may take place from the middle of May to the third week in June. For common turnips from fourteen to twenty-one days later will be about the proper time of sowing for such soils respectively. We frequently roll our common turnips if the land is highly manured and the weather is dry; consolidation of the loose soil arising from fallowing is necessary, and no injury is done to the turnip plant, which will certainly grow the faster for it in such weather. We have no hesitation in recommending the rolling of the turnip crop in dry seasons, and the best stage in their growth for this rolling is when the plants are in full broad leaf, and before setting out. The steeping of seed is recommended, and in particularly obnoxious mixtures, with the view of making the plant unpalatable to the fly. We cannot think this plan of much service, but combined with rancid manures, it possibly may be of some avail. The great, and as we think the only, safe remedy is in obtaining a perfect tilth, giving it a plentiful supply of stimulating manure to force the young plants, and then to follow this up by frequent and early hoeings. We also strongly advocate early preparation of the land, and then to wait awhile for a favourable time for sowing, when, as we stated in our paper on Mangolds, all the appliances of the farm should be brought to bear upon it, and the whole got in at once. We need not say we also strongly advocate a thick seeding, certainly not less than four pounds per acre. Adopting these precautions we generally succeed in getting a good crop, and can scarcely remember a failure either in mangold or turnips. We confidently recommend a similar course, and the adoption of similar precautions and appliances to our readers.

FIRST GREAT MEETING OF THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The annual meeting was held at noon, on Wednesday, June 9, Lord Portman presiding.

The following report was read by H. St. John Maule, Esq., the Secretary:

REPORT.

In submitting a report of the proceedings of this Society to its members, according to the 6th rule, it will not be necessary to detail the reasons which have caused the Society, in the 75th year of its existence, to hold, for the first time, its annual meeting in the summer at a distance from the city in which it was originally founded. Another opportunity may present itself for giving some account of the past history of the oldest agricultural society in England. It may suffice to say, on this occasion, that the present plans of operation bid fair to fulfil the original purpose of its establishment more completely than ever. Actuated by this conviction, the members of the Society as originally constituted decided at their annual meeting, held in Bath, on the 3rd December, 1850, to take into consideration a plan for extending the operations of the Society by holding a summer meeting for the exhibition of breeding stock and implements at different places in successive years.

A provisional committee was then appointed, who entered into communication with the Devon County Agricultural Society. The negociation terminated in a union formed between the two societies. The Council feel bound to acknowledge the valuable aid furnished by Mr. R. Dymond, the late Secretary of that Society. A communication was then opened with the trustees of the surplus remaining from the fund raised for the reception of the Royal Agricultural Society at Exeter, which surplus had been set aside for "the advancement of agricultural science," by some means to be determined at a public meeting of the subscribers. The interest of that fund has, at present, been placed at the disposal of this Society; but the capital remains in the hands of the trustees, who can only deal with it under the authority of another public meeting of the subscribers. A report was then drawn up, containing a recommendation of a new code of laws. This report was finally adopted on the 30th August, 1851. The new code of laws which it contained thereby became the laws of the Bath and West of England Society, under which it has been administered since that date.

In accordance with the suggestions in the report, thirty-six members of the Council were appointed at three meetings, held succesively at Bath, Taunton, and Exeter. Since then, however, three vacancies have occurred by the resignation of gentlemen so appointed, which must now be filled up, and twelve more are to be appointed to complete the full number of forty-eight, who will continue in office till the annual meeting to be held during the year 1853 in the western district.

The Council held their first meeting at Taunton, and, in pursuance of the general powers entrusted to them for carrying the new plans into effect, nominated Lord Portman president for the current year. Those noblemen and gentlemen then acting as the vice-presidents of this society were continued in office, and other noblemen and gentlemen were added to the list, with a view to preserve the balance between the western and eastern districts without resorting to the uncourteous steps of requesting any of the former V.P.'s to retire. And although the number is unusually large, it is hoped that no inconvenience will permanently result. It is proposed to summon to the council only such V.P.'s as intimate their willingness to attend. The council appointed as their secretary the gentleman who was acting as hon. secretary: they assigned to him a salary of 50 guineas, and his services for the past year have been far more than adequate to such salary.

Two treasurers have been appointed, one for the eastern, the other for the western district, who undertake the trouble gratuitously.

Several gentlemen have kindly promised to act as local correspondents in the various districts, and to use their influence in extending a knowledge of the society and increasing its income. They have been authorized to receive subscriptions. It is much to be desired that a local correspondent should be formed in or near every market town, as the punctual collection of subscriptions is one of the most urgent necessities, and unhappily one of the greatest difficulties, of agricultural societies.

The number of subscribers has considerably increased, and now is about 420; but it is very much to be desired that a further increase should take place. The whole amount which the council can at present calculate upon receiving from subscribers may be estimated at about £550 16s. 6d., besides donations and life contributions to the extent of £150. The amount of cash already received is £809 4s. 5d. This sum includes the sum of £200 contributed by the town of Taunton, and £100 paid over by the Devon Society, which will not recur in future years. A further vote has also been promised by the Devon Society.

The towns of Taunton and Bridgwater promptly and liberally responded to the proposal to hold the summer meeting at one of those places. It was decided that the Society's first meeting should be held at Taunton.

A local committee was there formed for the purpose of taking active steps to prepare for the exhibition, and to make such general arrangements as should be deemed expedient for carrying the same into effect. Mr. H. Blandford, of Orchard Portman, offered in the most liberal manner the gratuitous use of a piece of land for the trial of instruments. His offer was gladly accepted, and a vote of thanks to the Council was communicated for the same.

After frequent meetings of the Council, the list of prizes was ultimately settled, and ordered to be published. The prizes therein offered amount in the whole to £484, distributed in the following manner, viz.:—£148 for cattle; £99 for sheep; £30 for pigs; £40 for horses; and £167 for implements, which last item includes a prize which is a new and striking feature in agricultural exhibitions, peculiar to this Society, being the prize of £20 for the most economical collection of implements suited to tenants occupying arable land not exceeding 100 acres. It has been responded to by the implement-makers, and it is hoped that it will be productive of much practical utility, especially to those whose funds for the purchase of implements is necessarily limited. The Council delegated the selection of judges to a committee of five, from whom they have received the following report, which they trust will be satisfactory to the members generally.

Your Committee have to report that the names of 126 exhibitors have been entered for competition, consisting of 77 exhibitors of stock and 49 exhibitors of implements. There are 238 entries of stock, and the entries of implements are upwards of 400.

The number of head of cattle amounts to 379.

The number of exhibitors of stock and implements in each district is as follows:—

NUMBERS OF EXHIBITORS, WITH THE DISTRICTS FROM WHENCE THEY COME.

Name of district, county, or city.	*No. in each.*
STOCK.	
East Somerset	5
West ditto	40
North Devon	22
South ditto	2
Dorset	1
Cornwall	1
Wilts	4
Gloucestershire	1
Bristol	1
Total	77
IMPLEMENTS.	
East Somerset	5
West ditto	13
North Devon	13
South ditto	2

The following gentlemen have consented to give their active services in the various departments of the exhibition:—Mr. Hussey, of Waybrook, Exeter, director of the show-yard. Stewards of the stock: Mr. Webb King, Bridgwater; Mr. C. Gordon, Winscombe; Mr. W. Porter, Hembury Fort, Honiton. Stewards of the implements: Mr. H. Paramore, North Petherton; Mr. H. Blandford, Orchard Portman; Mr. S. Pitman, Rumwell Lodge, Taunton.

The Committee appointed to select the judges beg leave to report that the following gentlemen have consented to act—For Devons, and long-woolled sheep: Mr. Trethewy, of Grampound,

Cornwall; Mr. Partridge, of Bow, Devon; Mr. Robert Smith, Emmett's Grange, Somerset. For other cattle: Mr. Gray, of Kingweston, Somerset; Mr. Leech, of Kilmington, Wilts; Mr. Beavis, of Chard, border of Dorset and Somerset. For implements: Mr. Amos, Consulting Engineer of the Royal Agricultural Society; Mr. Outhwaite, an officer of the Yorkshire Society and one of the Jury of the Exhibition of 1851; Mr. Willis, of Dinnaton, near Barnstaple; Mr. Salter, of Combe Farm, Crewkerne. The last-named gentleman being disabled by severe illness from acting, Mr. May, of Dunsford, is ready to act in his place.

The committee cannot but congratulate ths society on having succeeded in obtaining the services of men of so much ability, reputation, and experience as Mr. Amos and Mr. Outhwaite, to aid them in placing their first exhibition of implements on a good footing. In associating with those gentlemen two practical farmers residing within the district, the object has been, not so much to aid them in deciding on the mechanical merits of the different implements, as to ensure the practical wants of the West of England farmer being fully taken into consideration.

The committee recommend that the following instructions be communicated to the judges:—

"That they be requested generally to bear in mind the object of this society—namely, to benefit the agriculture of the West of England; and, therefore, that those animals and implements should be encouraged which are suited to the soil, climate, and other peculiarities of the district.

"With regard to cattle and sheep and pigs, not to take into consideration the present value to the butcher of the animals exhibited, but to decide according to their relative merits for the purpose of breeding; therefore, that particular attention should be given to those points which indicate a tendency to produce offspring with healthy constitutions, with due regard to symmetry, size, and such other points as afford the best prospect of profit.

"With regard to horses, to consider especially the qualifications for farmers' work in a hilly country, whether as agricultural horses or as hackneys.

"With regard to implements, to bear in mind that in the West of England farms are generally of small extent; to give especial attention to small implements for the cultivation of green crops and for the preparation of food for stock, and generally to give the preference to implements of simple construction, light weight (with due regard to strength), handy for use in a country in which stony ground is very common.

"With regard to all classes of stock and implements, to give no prize in any class in which the articles exhibited do not possess sufficient merit to deserve a recommendation."

Your committee report that the management of the exhibition of poultry, &c., has been left in the hands of the local exhibition committee. Your committee also desire to record the warmest encomiums for the alacrity, skill, and energy displayed by Mr. Gillett, the chairman, and the other gentlemen comprising the local exhibition committee, in their arduous task in providing for the details of, as your committee trust, a most efficient display, the result of the endeavours of the council and the various sub-committees to whom the affairs of the society have been entrusted.

Your committee cannot conclude without recording a hearty acknowledgment of the handsome and liberal manner in which their call has been responded to by the town of Taunton, whose co-operation and liberality has far surpassed their most sanguine expectations; and they hope that the occurrence of this first summer meeting of the Bath and West of England Society may long be remembered with gratitude for their hospitable reception.

Your committee beg to suggest that the office of president for the ensuing year should be offered to Sir Thos. Dyke Acland, Bart., M.P., of Killerton, Devon; and they place before you the names of the following gentlemen, namely, for the eastern division, H. Blandford, Orchard Portman; S. Pitman, Rumwell, near Taunton; W. Sturge, Bristol; John Gray, King Weston; W. B. Naish, Stone Easton; T. Danger, Hunstile, Goathurst; T. C. Colthurst, Thurloxton, Bridgewater; for the western division, H. Trethewey, Grampound; Capt. Buller, Whimple; R. H. Clarke, Bridwell, Collumpton; T. A. Knollys, Buckland Filleigh; A. Acland, J. F. P. Phillips, Broomborough; J. Widdicombe, Ugborough; J. Belfield, Blagdon, near Paington; C. A. Saunders, Stoke Hill, Exeter.

PRIZES FOR CATTLE, &c.

Judges:—For Devons, long-woolled sheep—Mr. Trethewy, of Grampound, Cornwall; Mr. Partridge, of Bow, Devon; Mr. Robert Smith, Emmett's Grange, Somerset. For other cattle—Mr. Gray, of Kingweston, Somerset; Mr. Leach, of Kilmington, Wilts; Mr. Beavis, of Chard.

CLASS 1.—Mr. J. Tucker, of Staplegrove, a 4 years and 4 months Devon bull, bred by the Rev. C. Boucher. First prize, £12.

Mr. T. Webber, of Halberton Court, a 4 years and 2 months old pure Devon bull, bred by Mr. J. Duckham, of Halberton. Second prize, £5.

Mr. C. Gibbs, of Bishop's Lydeard, a 4 years and 7 months old Devon bull, bred by Mr. W. M. Gibbs, of Bishop's Lydeard. Highly commended.

Mr. S. Farthing, of Stowey Court, a 3 years and 5 months old Devon bull bred by himself. Commended.

CLASS 2.—Mr. R. Wright of Moor Farm, a 2 years and 4 months Devon bull, bred by himself. First prize, £12.

Mr. J. Quartly, of Champsen Molland, a 1 year and 5 months Devon bull, bred by himself. Second prize, £5.

Mr. C. Gibbs, of Bishop's Lydeard, a 1 year and 11 months Devon bull, bred by the Rev. C. Smith, of Bishop's Lydeard. Commended.

CLASS 3.—Mr. W. M. Gibbs, of Bishop's Lydeard, a 1 year and 5 months Devon bull, bred by himself. The prize, £5.

Mr. J. Quartly, of Champsen Molland, a 1 year and 6 months Devon bull, bred by himself. Commended.

CLASS 4.—Mr. S. Farthing, of Stowey Court, a 3 years and 2 months Devon in-milk cow, bred by himself. First prize £10.

Mr. J. K. Farthing, of Nether Stowey, a 3 years and 5 months Devon in-milk cow, bred by himself. Second prize, £5.

Mr. T. W. Fouracre, of Durston, a 5 years and 6 months Devon in-milk cow, bred by himself. Highly commended.

The Rev. C. Smith, of Bishop's Lydeard, a 5 years and 6 months Devon in-milk cow, bred by himself. Commended.

Mr. J. Hole, of Knowle House, an 8 years and 3 months Devon cow, bred by himself. Commended.

Mr. J. Tucker, of Staplegrove, a 3 years and 4 months old Devon in-calf cow, bred by himself. Commended.

CLASS 5.—Mr. W. M. Gibbs, of Bishop's Lydeard, a 2 years and 6 months old in-milk Devon heifer, bred by himself. First prize, £10.

Mr. W. M. Gibbs, of Bishop's Lydeard, a 2 years and 7 months in-milk Devon heifer. Second prize, £5.

CLASS 6.—Mr. J. Hole, of Knowle House, a 1 year and 6 months Devon yearling heifer, bred by himself. First prize, £5.

Mr. W. Baker, of Bishopsnympton, a 1 year and 8 months Devon yearling heifer, bred by himself. Highly commended.

Mr. W. M. Gibbs, of Bishop's Lydeard, a 1 year and 6 months Devon yearling heifer, bred by himself. Highly commended.

CLASS 7.—Mr. C. Hardcastle Abbot, of Long Ashton, a 3 years and 1 month short-horned bull, bred by the representatives of the late Sir J. Smyth, Bart., of Ashton Court. First prize, £12.

The Hon. P. Bouverie, of Cannington, a four years and 1 month bull, bred by Mr. Grant, of Stoke. Second prize, £5.

Mr. I. Niblett, of Fellan, a 2 years and 10 months bull, bred by the Right Honourable Viscount Hill. Commended.

CLASS 8.—Mr. R. Stratton, of Bishop's Hinton, a 1 year and 4 months bull, bred by himself. First prize, £12.

Mr. J. S. Bult, of Kingston, a 2 years and 4 months short-horned bull, bred by the Rev. I. Vane. Second prize, £5.

CLASS 9.—Mr. R. Stratton, of Bishop's Hinton, a 1 year and 1 month bull, bred by himself. The prize, £5.

CLASS 10.—Mr. R. Stratton, of Bishop's Hinton, a 4 years and 8 months cow, bred by himself. First prize, £10.

Mr. R. Stratton, of Bishop's Hinton, a 3 years and 2 months bull, bred by himself. Second prize, £5.

CLASS 11.—Mr. R. Stratton, of Bishop's Hinton, a 2 years and 4 months heifer, bred by himself. First prize, £10.

Mr. R. Stratton, of Bishop's Hinton, a 2 years and 3 months heifer, in calf, bred by himself. Second prize, £5.

CLASS 12.—Mr. Richard Stratton, of Bishop's Hinton, for two 1 year and 4 months yearling heifers, bred by himself. First prize, £5.

CLASS 13.—Mr. G. Radmore, of Thorverton, a Leicester shearling ram, 16 months, bred by himself. First prize, £5.

Mr. J. Bodley, of Stockley Pomeroy, a long-woolled ram, 14 months, bred by himself. Second prize, £3.

Mr. G. Radmore, of Thorverton, a Leicester shearling ram, 16 months old, bred by himself. Commended.

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Mr. G. Radmore, of Thorverton, a Leicester shearling ram, 16 months, bred by himself. Commended.

CLASS 14.—Mr. J. Moon, of Lapford, a Leicester ram, 51 months, bred by himself. First prize, £5.

Mr. J. Bodley, of Stockley Pomeroy, a long-woolled ram, 26 months, bred by himself. Second prize, £3.

Mr. J. Bodley, of Stockley Pomeroy, a long-woolled ram, 25 months, bred by himself. Commended.

Mr. G. Turner, of Barton, a ram, 42 months, bred by himself. Commended.

Mr. G. Turner, of Barton, a ram, 42 months, bred by himself. Commended.

Mr. G. Turner, of Barton, a ram, 54 months, bred by himself. Commended.

Mr. S. Partridge, of Landford, a Leicester ram, 27 months. Commended.

CLASS 15.—Mr. G. Limbrick, of Orton, near Chipping Sodbury, a pen of 6 ewes, bred by himself. First prize, £5.

Second prize not awarded.

CLASS 16.—Mrs. E. Bond, of Chedden Fitzpaine, a pen of five long-woolled shearling ewes, 16 months old, bred by herself. First prize, £5.

CLASS 17.—Mr. J. Moore, of Pewsey, a Southdown yearling ram, 16 months old, bred by himself. First prize, £5.

Sir J. Kennaway, of Ottery St. Mary, a Southdown yearling ram, 16 months, bred by himself. Second prize, £3.

CLASS 18.—Mr. J. Moore, of Pewsey, a Southdown ram, 27 months, bred by himself. First prize, £5.

Mr. Watts, of Freshford, a Southdown ram, 42 months, bred by Mr. Deer, of Dwinford, Wilts. Second prize, £3.

CLASS 19.—Mr. J. Risdon, of Birkham, a pen of five Southdown ewes, bred by Mr. S. Mills. First prize, £5.

Mr. T. B. Morle, of Bridgwater, a pen of five Southdown ewes, bred by himself. Second prize, £3.

Mr. J. Moore, of Pewsey, a pen of five Southdown ewes, bred by himself. Commended.

CLASS 20.—Sir J. Kennaway, of Ottery Saint Mary, a pen of six Southdown shearling ewes, 16 months, bred by himself. First prize, £5.

CLASS 21.—Mr. T. Danger, of Huntstile, a yearling ram, 17 months, bred by himself. First prize, £5.

Mr. T. Danger, of Huntstile, a yearling ram, 17 months, bred by himself. Second prize, £3.

CLASS 22.—Mr. G. Coombe, of Creech St. Michael, a Dorset ram, 53 months, bred by himself. First prize, £5.

Mr. W. Kidner, of Milverton, a ram, 54 months, bred by Mr. W. Biffin. Second prize, £3.

CLASS 23.—Mr. J. Culverwell, of North Petherton, a pen of five Dorset ewes, bred by himself. First prize, £5.

Mr. G. Coombe, of Creech St. Michael, a pen of five Dorset ewes, 53 months, bred by himself. Second prize, £3.

CLASS 24.—Mr. G. Coombe, of Creech St. Michael, a pen of five Dorset shearling ewes, 17 months, bred by himself. First prize, £5.

Mr. J. Culverwell, of North Petherton, a pen of five Dorset shearling ewes, bred by himself. Commended.

CLASS 25.—Mr. J. Nurcombe, of Hopcott, a mountain ram, 40 months, bred by Mr. James Quartly, of Molland. First prize, £4.

Mr. J. Nurcombe, of Hopcott, a mountain ram, 64 months, bred by Mr. James Quartly, of Molland. Second prize, £2.

CLASS 26.—Mr. J. Quartly, of Molland, a pen of five pure Exmoor ewes, 52 months, bred by himself. First prize, £4.

Mr. J. Nurcombe, of Hopcott, a pen of five pure Exmoor ewes, 28 months, bred by himself. Second prize, £2.

CLASS 27.—Mr. H. Blandford, of Sandridge, a Berkshire boar, 1 year and 11 months, bred by himself. First prize, £4.

Mr. H. Blandford, of Orchard Portman, a boar, 2 years and 5 months, bred by himself. Second prize, £2.

CLASS 28.—Mr. H. Blandford, of Sandridge, a Berkshire sow, 10 months, bred by himself. First prize, £4.

Mr. H. Blandford, of Orchard Portman, a breeding sow, 1 year and 5 months, bred by himself. Second prize, £2.

CLASS 29.—Mr. H. Blandford, of Orchard Portman, a pen of three breeding sows, 4 months, bred by himself. First prize, £2.

A second prize, same person, £1.

CLASS 30.—Mr. Northey, of Lake Lifton, a boar, 2 years and 6 months, bred by Mr. Rogers. First prize, £4.

Mr. J. Risdon, of Birkham, a Leicester boar, 1 year and 11 months, bred by himself. Second prize, £2.

Mr. G. Turner, of Barton, a boar, 2 years and 6 months, bred by himself. Commended.

Mr. J. Moon, of Lapford, a boar 8 months, bred by himself. Commended.

Mr. J. Radmore, of Thorverton, a boar, 9 months, bred by himself. Commended.

CLASS 31.—Mr. Northey, of Lake Lifton, a breeding sow, 3 years, bred by Mr. W. Rogers. First prize, £4.

Mr. J. Moon, of Lapford, a breeding sow, 1 year, bred by himself. Second prize, £2.

Mr. R. Mead King, of Pyrland Hall, a breeding sow, 11 months, bred by Mr. Thomas Dyke Acland. Commended.

CLASS 32.—Mr. J. Moon, of Lapford, a pen of three breeding sows, 7 months, bred by himself. First prize, £2.

Mr. W. Northey, of Lake Lifton, a pen of three breeding sows, 7 months, bred by himself. Second prize, £1.

CLASS 33.—Prize withheld, because not of sufficient merit.

CLASS 34.—Mr. Edmund Wilcox, of Mear, near Wells, a cart mare, 6 years and 1 month old, bred by himself. First prize, £10.

Mr. R. Corner, of Torweston, a mare and foal about 10 years. Second prize, £5.

CLASS 35.—Mr. C. Champeney, of Theale, a thorough-bred horse, bred by Mr. William White, of Yeovil. First prize, £10.

The Judges of Classes 1, 2, 3, 4, 5, 6, 13, 14, 15, 16, 33, 34, and 35, were Messrs. Henry Nethen, John Partridge, and Robert Smith.

For Classes 7, 8, 9, 10, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, the Judges were Mr. John Gray, Mr. Joseph Lush, and Mr. John Peville.

COTTAGE-GARDENING IN CORNWALL.—Many cottagers in this neighbourhood have their "green-house." These are generally on a small scale, and of a simple construction—nay, some of them are even a little rude in workmanship. Nevertheless, they are green-houses; and as such, in many instances, they are considered a great acquisition, being looked upon as adding very materially to the pleasures derived from their little gardens. We may take it for granted, all classes of

persons who take much interest in plants suited for either the greenhouse or flower-garden decoration do value at a high rate tender productions, especially when such are reared under their own care and management. There are many pleasing features belonging to this very interesting department of cottage economy and recreation—indeed, many more than I can take upon myself to describe. In attempting to select, it is not so much what to leave out as where to begin, so that a good general view may be comprised, without trenching unduly upon time and space. Although many might be instanced as worthy of notice, and highly creditable to the growers, viewing circumstances as they are, I think the first and one of the most pleasing tendencies relating to this department of cottage-gardening is the encouragement given to study vegetable nature, its beauties and development, at least in so far as relates to those plants immediately under their care. Before entering more into detail, I may just observe that the majority of these greenhouses differ at least in one thing from what greenhouses are in other parts of England—in that of being without any heating apparatus. Towards the south coast there has not been, for years past, sufficient frost to injure common greenhouse plants, such as those generally grown by cottagers here. This is one advantage, and a great inducement to build greenhouses, as it is free from that annual expense and care entailed upon those who erect houses where they require a good fire, perhaps for weeks together, to keep out the frost during the winter. It is interesting to see a few of these greenhouses. Those I allude to generally belong to the industrious classes—tradespeople—who invariably attend to them themselves. Their collections for the most part are composed of soft-wooded plants. We all know many of these are easily grown, and, with judicious management, may be had in flower every month of the year. Of these are Geraniums, Fuchsias, Petunias, Verbenas, Chinese Primroses, Cinerarias, Calceolarias, Balsams, Roses, Camellias, Cacti, Cupheas, and a few other things. Although equally hardy, few try Heaths and Epacrises. We have no peat earth here.—G. Dawson.

[It is a point not sufficiently attended to, as we think—that is, the wide difference between the condition of plants along the coast, and the same kind of plants more inland. There are gardens along the west coast of Scotland even, where more than two or three degrees of frost is never known. So also, in Cornwall, the climate is still milder, and the frosts still more feeble. This, then, is what we especially refer to. Any person writing and discussing the treatment and culture of tender plants, in relation to such a climate, as compared with that which prevails in most of the midland counties, where few winters pass with less than fifteen or more degrees of frost—and this may be attended with a variety of adverse and aggregated circumstances, besides being prolonged for weeks or months—it can be no guide to the ordinary operations of a *midland* gardener to know that certain plants live through the winter without protection in such situations, or that, with little care and less forethought, early Peas, wall-fruit, Cauliflowers, and other crops come to maturity and attain perfection with much less risk and care than is required at a distance from the sea-coast; and no fair comparison can be made without a correct knowledge of these circumstances; hence the necessity of stating these particulars, as in the instance before us.]

THE TURNIP FLY.

If the prevalence of insects on the beans and peas, on the gooseberries and peaches, is to be taken as any criterion of the mode in which other crops are likely to be dealt with, we may expect this to be an "insect year." We mentioned, when speaking of the bean weevil a few weeks ago, that the prevalence of east winds had long been considered favourable to insect development, and this is also the case with the bulk of dry seasons. The year 1852 has, so far, been extremely dry; the prevalence of really wet days has hardly been known, while even showers have been at a distance between each other, unusual in this climate. We have good reason to remember the awful struggles which the farmer had to undergo in the dry seasons of 1826-7-8; and the tremendous heat and want of moisture seemed to be aggravated by the myriads of insects which appeared to delight in sucking up the juices of the poor enfeebled plants. The entire crop of turnips was taken off, and the same with the second, and even the third sowing, especially in the year 1827. Turnip seed rose in price to a very great extent. All the old seed of two or three years old went up, and it was only when the new seed was grown and sown—so late in the season, indeed, that the insects became feeble, and possibly less numerous—that a few poor, feeble turnips were obtained. Now, though the dryness of the present year may be hoped to have partially passed off by the advent of the recent genial rains, there is every reason to expect a somewhat vigorous attack from the "turnip fly,*" as it is generally called, but more properly the "turnip-*flea* beetle."

On the swedes, in the latter end of May we generally begin to observe its first ravages. In the

* The *Haltica Nemorum*.

first week in June it seems particularly energetic and active. About the last week in June it seems somewhat more sluggish; while in the first and second weeks in July it becomes decidedly feeble, and after that period can scarcely be said to do any injury.

The attack of a field, be it one or a score of acres, seems to be made simultaneously by thousands; and every plant has, in a bad year, its two, three, or four beetles. The plant may come up well and regular, the seed-leaves begin to expand, and the plumula begins just to form, when a sluggishness seems to seize the plant, and the next morning perhaps there are endless thousands of fleas devouring the leaves. They eat up the whole substance of the fibres and mass of leaves, leaving neither vestige of the one nor the other.

Where can they come from?

Endless have been the theories of their development; and if ever an insect seemed to favour the vision of equivocal generation, surely it is the turnip flea. One writer insisted that the eggs must be deposited on the seed, and hence advised oleaginous and saline steeps; and a very old remedy—attempt at prevention we should say—was practised in 1827-8 by the admixture of flour of sulphur with the seed. It did not succeed. Some thought it did a little good where the insects had a choice, and that they would select undoctored plants in preference to those whose seed had been treated with the nostrum.

A Mr. Sutton imagined them to be bred in the soil, and their development aided by the frequent turning up of the soil. Hence he advised the land to be perfectly still for three weeks, or, if possible, a month before sowing. That this would have a favourable influence on the plant there can be no doubt. It would secure it a plentiful supply of moisture in a dry time, and so be highly conducive to its rapid development.

But the real natural history of the insect has been brought to light by Henry Le Keux, Esq. The insects begin to pair in the month of April, and continue to do so till September. The female deposits her eggs in the under-side of the turnip plants, as soon as they appear above ground. In a few days these hatch, and form maggots, which burrow in the interior of the cotyledon-leaves, feeding on the pulp. These are invisible, and account for the slow growth of plants before the perfect beetle begins to appear in any numbers. They continue in this state about sixteen days, and then drop into the earth and form chrysalides, and continue so fourteen days longer. Thus the charlock forms a nursery for the insects which attack the swedes, and the swedes for those which prey upon the white and yellow turnips.

Mr. Le Keux kept the beetles from July to February, so that they are not so short-lived as many insects; and hence they are always more ready to attack, but they only produce but few larvæ. As little as one egg per day was deposited by those Mr. Le Keux had, at least in confinement. They are most active in dry, hot days. With a sunny day, and the thermometer at 70 deg. in the shade, they will leap upwards of 200 times their own length—a leap which, if accomplished by a man, would be some 400 yards! We shall not attempt to describe this "skipjack"—he is, unhappily, by far too familiar to every farmer—but rather to endeavour at describing those plans which have been found most successful in practice in preventing or modifying the severity of their ravages.

The first obvious process is by all means to hasten the *early development of the plant*. A very old, and often successful, plan is to sow large quantities of seed. This is favourable for two reasons. Like numerous trees in a forest, in their early growth they draw each other up, and so get more rapidly out of the way of the fly; but what is more, there are but a definite number of parents, which can only deposit a limited number of eggs, so that the chances are the food will be in excess of the insects.

This, however, is only a palliative process. Artificial and highly-soluble manures, which push on the plant rapidly, are very favourable. We never yet saw an instance, where the land was fine and moist—conditions always necessary to turnip-development—and when dissolved bones have been judiciously used, that the insect was able to destroy the crop. They may attack, they may be numerous; but the plants will, as far as our experience and observation go, always beat them.

The cleaner the land is kept of charlock, the fewer will be the chances of the insects' propagation early in the month, and the greater the chances of the escape of the swedes.

We never, moreover, knew an instance where swedes sown as early as the 13th of May were ever destroyed. This is another important fact, and, in swede cultivation, must be borne in mind, as well as the circumstance that so great is the vital power of the swede, that, if the whole of the cotyledons are eaten, the stump, the plumula, will often strike out new leaves.

When the "rough leaf" sets in, the crop is out of danger.

But if the crop is threatened by an actual visitation, let no time be lost in dusting the whole with quick-lime. It may not quite prevent the insects' eating the plants; but they will nibble so slightly as to *give time*, and the crop may be saved.—Gardeners' and Farmers' Journal.

WINCHESTER FARMERS' CLUB.

The monthly meeting of the club was held on Saturday, the 10th April. Mr. E. Bennett and Mr. W. Pain, late of Woodmancot, proposed at the last meeting, were duly elected members of the club. Mr. Hinton Bailey proposed Mr. Thomas Godwin, of Slackstead, near Winchester, to be a member. The motion was seconded by Mr. James Reeves.

Mr. W. STRATTON said he had been requested by some agriculturists to intimate their desire to form a branch association in connection with the Winchester Farmers' Club. After a short discussion, Mr. W. Pain, the secretary, expressed his readiness, if it was the wish of the members, to go to Basingstoke for the purpose of affording any information which might be required for carrying the object into effect. Mr. Stratton agreed to communicate this to those desirous of forming the society.

The SECRETARY announced that the subject for discussion at the next monthly meeting of the club would be, "The present position of the British farmer, and his duty at the coming election," by Mr. T. Pain.

The CHAIRMAN then said that the subject for discussion on that evening was one which he was confident all would be pleased to be informed on; and for his own part he should be doubly pleased if Mr. Stratton should be enabled to prove that hill country was advantageous to a farmer, or that farming on any land was so at present. He would, therefore, not detain them now by offering any observations, but call upon Mr. Stratton to enter upon the subject for discussion:—"Hill or Light Land Farming—its Advantages and Disadvantages on Heavy Land."

Mr. W. STRATTON said, that in bringing this question forward, it was quite out of place to suppose that he could supply any information to those he was now addressing. It would be his aim to show what had been the results of his own practice, and that of other persons whose experience could be relied on. He would endeavour to show, as far as he was enabled, the most advantageous mode of cultivation, to save them from loss of money, but not to shew them any profit. It would be impossible for him to advance anything new on the subject of hill farming, after what they had heard on a former occasion from the worthy chairman, or to go into stock farming, which had been so ably brought forward by Mr. William Pain, or to describe the means of culture, after Mr. Nesbit's intelligent lecture on the use and adulteration of manures. The hill land of this county and of the adjoining one were so nearly allied, that they were almost identical with each other. Many farms in this county varied, some consisting of light land, and others of strong land. The strong land, as they were aware, required deeper ploughing and more cultivation than the former. The general mode of cultivating the land was the four-field system in all cases; but in this they would be guided by their own judgment, according to the quality of the land, which might be strong or sour. The four-field system they all knew consisted of wheat, turnips, barley, and grass; but it would be folly in a man to follow that system in all cases. If, for instance, he had fed off strong land swedes late and in wet weather, it would be impossible for him to bring it into barley with any sort of profit, as the land would be in an unkind state, and would not work. Chalking on heavy and sour land must be beneficial and a permanent improvement, by imparting to it a friable nature, and rendering it easier to cultivate and better for stock. The expense of chalking varied from thirty to thirty-five shillings per acre, of eighteen bushels to a pole, of which the landlord ought to bear his part, or give to his tenant that security which he was entitled to, and not expect him to ask for alms when benefiting his land. With respect to light land, it ought to be made more adhesive, by means of salt or artificial manures, and by pressing to get it firm. He knew a gentleman who lived near Salisbury, who had a great proportion of water meadow and some portion of pasture land, who formerly pursued the four-field system, but the last few years has sown it in a five-field system; and the returns were about a quarter of wheat and one quarter and a half more of barley per acre. One circumstance which he would mention was, that land which lay at a distance on the hills might be successfully treated by the crop being threshed out, and leaving the straw spread on the ley ground in the autumn. In proof that the five-field system was pretty nearly right, if they looked about this neighbourhood they would find that the best and most successful farmers sowed about one-third or two-fifths of their land with corn. They saved a great amount in the expense

of seed and tillage, and were remunerated by the quantity of sheep which they kept extra; and therefore to them turnips were a very essential crop. His experience had told him that on light land once ploughing in the autumn, and scarified in the spring, was better than stirring, as it kept in the moisture, and there was more certainty that it would stand free from fly, and produce a greater crop. Mangold wurzel was beneficial to a stock farmer, as it was useful in the spring and summer part of the year, it being a cooling sort of a root; but to cultivate it to a large extent in Hampshire he believed would be wrong. A friend of his, who lived in Pewsey Vale, used to grow a hundred acres of it, but he had now very much decreased the quantity. With regard to sainfoin, which was believed to be a most essential and valuable root to a farmer, it must be cultivated according to the extent of land occupied, and the quality of the soil—two-fifths on a poor land farm, and even up to a third was advisable; but if they had a greater proportion of water meadow, pasture, or down, and the soil better, then they would not require so large a proportion. It was a hardy plant certainly, for no frost had been known to attack sainfoin hay or its roots; therefore it was the first great leading article which they ought to cultivate in this county, because it provides food for the sheep, and produces manure at the least possible expense. The quantity of seed used on an acre was about five bushels; many sowed six, others only four; but four bushels per acre drilled were equal to five sown, because the seed was deposited at a more equal depth. In breaking up, some advocated one plan, and some another. That which he conceived to be the best mode was that if it be strong hill country land, flinty and brashy, it should be ploughed and pressed, and well harrowed and clod crushed, to prevent the wireworm. If on light down land, he should prefer stifle-burning, which was an experiment rather new in this part of the country, though it was one which had been adopted for several years. He stifle-burnt a piece of land two years ago under most favourable circumstances. Last year it was in oats, and produced a fair crop —three or four quarters to the acre more than on land prepared in the usual way. His mode was to rafter and cut it in the usual way, and let it remain until it began to dry, then either scarify it with some of the drag tines taken out, or a nine-share with every other tine out, as keeping all the tines in made it too fine and dusty, besides driving it up together. When dry all through, rake it in heaps about the usual size, putting a twist of straw in the middle of the heaps from the bottom, pointing upwards, to come out at the windward side. When the straw is well lighted, the hole where it came should be stopped; and when the smoke steams all out round the bottom part, it should then be covered all over with the dry mould to stifle in the smoke; the heaps should be looked after to see that they do not go out, and will burn out in two or three days. By this process we got a better quality of ashes, and improved the land. From time to time the leases have been drawn up, covenanting that the four-field should be the system of cultivation pursued. But on a farm of any extent the land frequently varies so much that it is ridiculous that any particular system should be laid down, by so doing the skill and capital of the occupier is locked up to the detriment of all parties. With regard to the advantages of farming, he believed them to be very few. The improvements in machinery and artificial manures are beneficial; but when they came to view the disadvantage in which a farmer was placed with his capital invested in the soil, occupying land without security, and under a lease which prohibits him from exercising his talent—he was in a condition little better than a state of abject slavery. They had heard much about high farming, and Adam Smith's remark that he who made two blades of grass to grow where only one grew before, deserved well of his country, had been often quoted in support of it; but to this he would reply, that he who grew a blade of grass which cost him five-and-twenty shillings, and for which he could only get twenty shillings, was a fool. The farmer had to contend with that abominable law, called the Game Law; and had the blessed benefit of keeping the poacher in gaol, and his wife and family during the time. He had also to bear the weight of the county rates, which were heavily increased in consequence of the expense incurred in building police houses, &c., which ought to be borne by the landowners, and not by the occupiers of the soil. Mr. Stratton then noticed the altered position in which the farmers stood, remarking that many hundreds had invested their capital in the soil under the faith of the laws of this country; but they had been deceived by the very persons on whom they depended, who had turned their backs on them. Had they English blood in their veins would they again submit to such an imposition? Would they suffer a second wreck to be torn from them by those they had sent to Parliament, and who ought to have acted justly and honourably towards them? If he knew the character of Englishmen, if not bound down by the trammels of tyranny and injustice, they would take care, when the opportunity offered, to obtain for this great nation a just representation in Parliament. He hoped the time was shortly coming when they would do their best to return such men, not only for Hampshire, but throughout the kingdom, as would advocate their interests

The farmers had had protection withdrawn from them. If a five shilling duty would only give us two shillings increased price, it is of little consequence whether we have it or not. But those we send to parliament should endeavour to relieve us in other ways, instead of seeking for place, pension, and power.

Mr. W. Spearing said he was much pleased with the manner in which Mr. Stratton had brought the subject forward, and agreed with him as to the most beneficial mode of cultivating light lands. He had found the best mode to be, in breaking up old sainfoin, to plough and press the land, and, if for a wheat crop, to dung it in the winter, and sow the wheat in the month of September. He perfectly agreed that no particular system of cultivation ought to be dictated by a landlord to a tenant. He advocated the four-course system of barley, grass, wheat, and turnips. With regard to stirring for turnips, he agreed with Mr. Stratton as to his plan. He had been at Marshfield, in Gloucestershire, and had seen the operation of stifle-burning, and was nearly stifled by the smoke. He had never taken any interest in it, and had not tried it, because he did not think it would be of any advantage to our light lands, although he admitted that in Gloucestershire it might be beneficial. In allusion to Mr. Stratton's remark on persons who paid 25s. and only got 20s., he would say he was one of those fools. He fully concurred with Mr. Stratton that their means of defence were taken away, and that they ought not to be afraid of their landlords, but express their opinions freely, and choose such men as would fairly represent them in Parliament. If the tenant farmer was to be bound down, he had better be a slave than placed in such a degrading position.

Mr. Cundell observed that as stifle burning was comparatively a new system in Hampshire, he could not speak on the subject from any experience of his own; but he could speak of the lower part of Berkshire, the Vale of White Horse, where a friend of his took a farm of 700 acres of land, on which four farmers had successively failed. He set about stifle-burning: the consequence was that he had an increased crop of corn and turnips, which he attributed to stifle-burning. He mentioned this circumstance to show that it was beneficial to light lands. Mr. Stratton had spoken of the four-field system. On this he would observe that farmers were placed in a very different position than they were some years ago. They were now on a broader and more commercial situation, and ought to take their farms as tradesmen took their shops, and not be confined to any particular system. Instead of being limited to sowing two wheat crops, they should buy the soil, and use it as any other commercial men do, in what manner they conceived to be most advantageous to them. He condemned the restrictive covenants in leases, and fully concurred in the observations which Mr. Stratton had made.

Mr. Garrett was pleased with some of the remarks which Mr. Stratton had made, and there were some which perhaps he would explain. With respect to land in Wiltshire, it differed from that in this county, and comparing the quantity of produce brought to market, there must also be some difference. With regard to stifle-burning, in allusion to the remark made by Mr. Spearing, he would say that there was no smoke at all, except when the heaps were first lighted, because the object was to confine the smoke as much as possible, on account of the great benefit derived from it. He knew several farmers in Wiltshire who had adopted the system for several years, and still followed it up, which was a proof that they found it to be advantageous.

Mr. Walton said he was sure that the members had great reason to thank Mr. Stratton for the able discussion which they had just heard. He held in his hand a card from the Bridge-street Hotel, where the London Farmers' Club was held, announcing a discussion on a similar subject, to be introduced on Monday; he was therefore pleased to see that Hampshire men were anxious that their club should take the lead in all subjects of advantage, not only to the agricultural classes, but to the world in general. A good deal had been said about cultivating the soil on the four and five-course system, and on the growth of sainfoin. He had always understood that burning the soil was very injurious. If they burnt the rug and litter, that might be advantageous and beneficial. He had derived great benefit from the use of Crosskill's clodcrusher, which destroyed the eggs of the wireworm, grubs, and everything injurious to the growth of corn, and got rid of the rug. He found that in stifle-burning they did not do so, but burnt a great deal of the land. By keeping the smoke in the large heaps they retained the most valuable part; for, in his opinion, it became soot, which operated very advantageously on the land. In Essex, on the other side of Saffron Walden, where there was strong clay land, the system was found to be most advantageous. On a piece of ley ground on Pitt Down he had burnt part of the field, and the remaining part was ploughed and pressed. He sowed the whole with wheat, and where he ploughed and pressed he grew four quarters per acre, and only three quarters where he burnt. He thought that they had not arrived at perfection in the cultivation of any sort of soil. In a county well known to him, he meant the Yorkshire Wolds, where they

were not more than four inches from the chalk, they farmed expressly in no other way than on the four-course system. The farmers there got money, and brought up their children, but they never sowed sainfoin, rye, or vetches. He last year sowed 111 acres of winter oats and vetches for sheep, which he found to be expensive, and it also put him back in the wheat season. This was a great preventive of the growth of turnips, which he believed was a principal reason why the farmers in the Yorkshire Wolds did not sow them; in addition to which sainfoin, vetches, and other things, encouraged the grub, wireworm, and slug, which were great enemies to the turnip crops. In Yorkshire, the farmers breed all they fat, and fat all they breed. These men sowed half their land with corn every year; they had been boning for the past 60 years, and they found that one pound an acre expended on artificial manures would do more than all the four-course system. Last year he had 95 acres of backward turnips, and was obliged to buy hay, which cost him from £3 3s. to £4 10s. a ton, and it might have cost him £400. He found, if he sowed after turnips, he could grow wheat a great deal better. In his opinion the four-course system, with a sufficient number of sheep and a clod-crusher, was the grand secret in getting turnips on light land, which ought to be kept together as close as possible, kept clean from rug, and not exhausted. The best plan was to work the land well, and clod-crush it; they might then be able to grow wheat. Having recommended the use of salt, Mr. Walton contended that the farmers had not been deceived by the government, but by their landlords. They had been deceived by those who professed to have formed the present government; they had been deceived under false pretences. It gave him great delight to see that his brother farmers had left off their leading strings, and were looking forward to their own interest, and would no longer be abused by stewards or any underlings, and that they were influenced by far more honourable motives than the aristocracy or the government, and sought to obtain no advantage over any other interest in the country.

Mr. W. Pain said he had endeavoured to follow Mr. Stratton through the leading portions of his motion, and had made some notes on the subject. He had stated that strong land was heavier to cultivate than light, and he certainly felt that this had been his own case. He had been farming strong land for fourteen years, and found that he was obliged to double the number of his horses at the work which he would do were they employed on light land, and the number of men were increased in consequence. The system of cultivation which he pursued was the four-course system, and he generally left thirty or forty acres of land that had been fed off with swedes to come in with some green crop to feed with sheep, such as summer vetches, rape, or forward turnips, and afterwards sowed the land with wheat in the autumn, instead of endeavouring to get a crop of barley or oats that year, by which he was enabled to keep more sheep, and generally grew a good crop of wheat. With regard to beans, perhaps he had sown them three or four times in the spring, but must say it never answered his purpose. He had never sown winter beans, although he had seen it done with wonderful success by some of his neighbours. He found chalking the best thing he could do on the strong land. Where he had chalked a piece of land twelve years ago, he could plainly distinguish it at a distance. He had never sown a crop in that field which had not been evidence of its good effects by the abundant crops compared with the remaining part of the field. With regard to light land, in this county especially, instead of the four-course the five-course system had been pursued by some, and they had a two years' ley; but they were now backing out of it; for it had been proved that one year's ley was better than two years, as with the great variety of artificial manure very light land will grow wheat once in four years. With regard to mangold-wurzel, he had sown it, and had fed pigs on it entirely through the months of July and August, till they got on to the stubble after harvest, and never had pigs done better; he had also used it with great success with sheep and lambs. With respect to the cultivation of light land, he thought it a good system to keep one-fifth part of the farm in sainfoin, and to adopt the four-course or alternate system of cropping as far as possible, and leaving a portion of the land fed off with swedes to come in for a green crop, to be followed by wheat, as by so doing it obviated the necessity of getting in the seeds with the sheep in the spring before they had time to grow. In the breaking up of old sainfoin he would recommend ploughing and pressing. He generally had 20 or 30 acres to break up every year, which he ploughed and pressed, and gave it as much work as it was possible to do. It should, if possible, be sown in dry weather, because they could get the land more firm than they could in a wet season, as they could use Crosskill's clod-crusher. As to burning, he thought it might answer on light land; but he had tried it on strong land, and it had certainly been very injurious to him. Two pieces which he had burnt had never borne such good crops since that had been done, as the remaining part of the field. As for any particular system to be laid down for the cultivation of the soil, in his opinion it was quite out of the question, because, situated as they were, with such

a variable climate, it could not always be acted on. Mr. Stratton had headed his subject on hill farming, but he thought the discussion had taken a more general range, and this he believed was that gentleman's idea in bringing the subject forward, for the purpose of discussing the advantages and disadvantages of light land farming. On hills they generally found the strong land, and on the sides and in the vales the light land. Mr. Walton had mentioned that in Essex they objected to burning, and he certainly had heard it very much spoken against by an Essex man; but when they spoke of stifle-burning, and he heard the names of many practical men who had tried it with success, and from the remarks made in that room, he thought there must be some advantage in it. Mr. Walton had noticed the system pursued in Yorkshire, and he (Mr. P.) had seen a great deal of it in that county; and so much did he approve of it, that if ever he should farm on light land he would try it on a small scale, to ascertain whether it would answer. He was quite sure it was impossible in this part of the country to keep sheep entirely without hay, and he thought the climate in this county had a great deal to do with it. In the Yorkshire Wolds the atmosphere was much drier than in this county; during a dry season he had kept his sheep a considerable time without hay. He had 700 couples which went on a piece of turnips of about 13 acres, on which he put about a waggon-load of hay, all of which was not consumed, several trusses having been brought back again. But since the weather had changed within the last ten days, and the wind had got more to the southward, the air had become moister, and he had lost four sheep and twenty-one lambs from the scour. Whether it was the want of hay deranged the stomach of the sheep he could not tell. In conclusion, he sincerely trusted that whatever subjects were brought forward at the club would be always as honourably and fairly discussed as they had hitherto been, and he hoped this would continue to be the case, whether the subjects introduced were of a political or an agricultural nature.

Mr. J. Reeves fully concurred with Mr. Stratton in what he had said respecting the four-course and five-course system. His plan was to divide his farm into two parts, and to sow a large proportion of wheat, nearly one-fifth. He found that under this system he could grow as many sacks of wheat as he could of barley. He thought that in the case of breaking sainfoin up, the best way was to plough and press it. If stifle-burning was so beneficial, it was a question whether they should not burn the turf about the hedges.

The Chairman said, if they took the subject as it had been placed before them—hill country farming and light land farming—he thought that, taking a general view of it, light land must be less expensive to cultivate, and enabled the occupier to keep a larger number of sheep, and in harvesting the crops the casualty was not so great. This he took to be the advantage of hill farming. Then, on the other hand, if they looked to the disadvantages, it would be found that some who overstocked their land with corn got less produce. Taking both together, the question would be whether there was not an advantage in farming light land. He quite agreed that no particular system of culture could be laid down for a farmer to follow, yet he believed it to be right that he should have some system in view. He had heard that there were many farmers in that county who long had a system which they still continued to pursue; and, if they did not consider it to be profitable, they would not do so. Sainfoin was a crop which they could depend on when they had no grass. He knew a case where a farm, consisting of 600 acres of light land, had been taken on a lease, in which it was stipulated that one-sixth should be sown with sainfoin, that was 100 acres; 100 acres of wheat, 100 of turnips; half came in with barley and clover and grass the next year, so that there was a complete rotation once in eight years. Now whether that system was better than the four-field one, to bring in the barley after turnips, was the question. This system, as he had before stated, had been practised by many old agriculturists, who continued it, and he believed it to be profitable; therefore he thought no man ought to be confined to any particular system of cultivation, because he could not always get the land to work. In the four-field system, the regular rotation was wheat, turnips, barley, and grass. The old field system, he believed, had become quite obsolete on light lands. He was quite surprised to hear the great expense which Mr. Walton had incurred in the purchase of hay. He had no doubt that farmers in all cases must be guided by the seasons and by circumstances. On light lands they could never err in providing amply for live stock, for it was impossible to grow an average crop of corn unless they kept a sufficient number of live stock. He quite agreed in opinion as to the utility of sainfoin, and the necessity of taking advantage of the dry season to break it up. There was not a more useful implement on a light farm than Crosskill's clod-crusher, for nothing was so well calculated to consolidate the ground, and it might be used to advantage on sainfoin ley at the spring of the year. They often complained of the wire-worm on the land when there was no worm at all. If the land was properly consolidated, there would be no loss of plant. He believed it to be essential that they should keep an ample stock, and

sow a quantity of green food, and take care well to consolidate the land. Whether a four, five, or six-field system be adopted must be left to the better judgment of the occupier, who ought to be at liberty to sow as he pleased, and by his skill and energy be enabled to turn it to the best advantage. With regard to the utility of stifle-burning, Mr. Nesbit said it would prevent the ammonia from flying out. He (Mr. P.) supposed that the system they adopted in this county in burning grass or couch was something similar to stifle-burning. He believed the reason why they found it to be so advantageous in Gloucestershire was because there was a tile-stone in the soil, which became a sort of lime when burnt. Now the question was, whether in this county a similar benefit would be derived. His impression was, that where it was practised in Hampshire it made the land sour, and not so kind for artificial grasses after. It was best to decompose all vegetable matter, and bury it, and exclude it from the action of the air. He believed Mr. Stratton's intention was to confine his subject to light land, although, as Mr. Pain had observed, there was a good deal of strong land which would require very different treatment. He quite agreed that farmers must keep in view, and pursue the system which was most advantageous to them, by which they could grow large crops at the least cost. He was very much pleased with the observations he had heard during the discussion, which convinced him that it is in the power of every farmer to benefit his brethren, if he would take pains to impart the result of his experience to them. He trusted that the discussions brought forward at the club had been conducted in a fair and open manner, whether relating to practical agriculture or to political affairs connected with its interests.

Mr. STRATTON, in reply, said, that in bringing the subject forward, he was aware that strong land was situated on the tops of hills, and light land on the sides; therefore that was the reason why he drew the distinction between the four and five-field system. He believed the four-field system to be very good; but it could not be practised on all farms. It would be better to abandon the old system of burning in this county, and adopt the mode of lighting the heaps pursued in Gloucestershire. When he spoke of stifle-burning, he meant to convey that it was adapted to light, and not to strong land. He noticed that Mr. Stephen Mills, who occupied 4,000 acres or more on Salisbury Plain, had 100, which he was breaking up; and Mr. Harding, of Orcheston, in the same parish, had a piece of plate given to him for introducing stifle-burning in that neighbourhood. Having noticed the expense of feeding on oil-cake, Mr. Stratton said he was pleased that Mr. Pain had fallen into his views. Thanking them for the kind attention with which they had listened to his observations, he would conclude by proposing the following resolution:—

"That the chief advantage arising from the cultivation of a hill or light land farm as compared with a heavy land farm is the reduced expense of cultivation, and the large number of sheep that can be kept on the former at all seasons of the year; whereas on a heavy land farm sheep can only be kept in particular seasons; and that the keeping of sheep is the grand foundation of good, if not profitable farming, with the present low prices of corn."

The motion was seconded by Mr. W. Pain, who previously read the resolution.

The CHAIRMAN then read the resolution, *pro formâ*, which was put and carried unanimously.

Mr. CUNDELL observed that they would be very remiss if they left the room without tendering their thanks to Mr. Stratton for the very able manner in which he had brought the subject forward. He himself had come there in the hope of learning something, and had been amply repaid, and many, no doubt, would leave the room with a consciousness that two hours had been past that evening which had not been mis-spent. He hoped that the club would go on prosperously, increase the number of its members, and prove beneficial to all classes.

Mr. JAMES REEVES seconded the motion, which was put and unanimously agreed to.

Mr. STRATTON returned thanks for the compliment, and said, if his humble efforts had been the means of producing useful discussion, he was amply repaid.

Mr. WALTON proposed a vote of thanks to the chairman, which was seconded by Mr. Garrett, and agreed to unanimously.

The CHAIRMAN made an appropriate acknowledgment, and the members then separated.

INFLUENCE OF THE LATE SPRING ON THE WOOL CROP.

The peculiarities of the spring are showing themselves in a variety of ways. They seem to have affected more plants than one. The *wool*, considered by some amongst that class of beings, has been more affected by the season than would at first sight appear. Many flock-masters have had much fault found with them by the wool-staplers that their sheep had been badly washed. But the

ordinary care had been taken—the fleece appeared on the sheep's back as white as ever; still the unmistakeable shears showed it to be a bad colour. A little closer inspection proved that something new had occurred in the fleece. The outer wool was perfectly clean and white as usual, the wool next the skin was also the same; but the intermediate part was dark coloured, and had on it a sort of dirt on which the water seemed to produce no impression.

This is unusual. It is not very easily accounted for. Some account for it by assuming that the very dry state of the atmosphere in the months of February and March, accompanied by the east and north-east winds, had driven the March dust into the fleece, to which it had adhered, and that the water had now difficulty in ridding the wool of its contamination. That the injury seems to have been inflicted in that month there can be no doubt; but it seems no more probable that a sand or dust acquired in that month should not give way to washing any more than at any other period, unless it were peculiar.

The outside—the early grown, the wool most exposed to the action of the weather and dust—is easily cleaned; the wool adjoining the skin—the last grown—is also easily washed white; the fault is with that which may be supposed to have grown in February and March, for it has the whole of it had applied to it the self-same water. Nor is the failing in the back or sides, or any particular part of the fleece—it seems entirely the same over the whole animal. Nay, more; the interior of the wool may have had the same rubbing and care—must have had, indeed; and yet the one is clean and the rest is dirty.

We think it probable that the cause is deeper. The wool of the sheep, if healthy, will furnish a soap to wash itself. In good health, it will, if supplied with a sufficient running stream of clean water, and moderately rubbed, always wash white. And this year it has done the same, as regards the exterior and the interior wool, but the intermediate part of the fleece is still dirty. The yolk of the wool is that fuller covering of the skin which constantly exudes that most delicate and luxurious hair oil to the fleece of the animal. Vauquelin found it to have a saponaceous consistence, containing potash and soda, combined with carbonic and acetic acid. Now a single unhealthy check depraves or diminishes this secretion. It is insufficient or imperfect, and hence does not supply the soap to the water to wash out the dust it accumulated at the period of its growth. In all such cases we may expect the wool to be dirty and discoloured. The past spring has been dry indeed, but cold. The prevailing winds have been east and north-east, and these have been cold and piercing. No one who has carefully observed the sheep in health can have failed to observe the careful selection of a shelter in a north wind which all flocks of sheep strongly manifest. They are impatient of cold wind, and especially from that quarter, and this because it is unhealthy. Too many sheep fed on turnips have no shelter whatever. They are fenced off by hurdles or nets, both before and behind; and to see their collecting together for mutual defence from a determined north-wester is really pitiable.

Now we believe it is a fact that the sheep who have suffered most from this influence are precisely those fed on the exposed and hedgeless wolds of Lincolnshire and of Yorkshire; for there are innumerable instances where the upland sheep have had the disaster in their fleeces to which we have alluded—those fed on the low lands have escaped. And more instances have occurred, where a party has, early in spring, purchased wold sheep, and turned them into his own flock; and his own have washed perfectly clean, while the others have been dark and dirty.

Now there is no very obvious cure at the present period. Where practicable, a second washing will be highly desirable: a second turn may wash out the dirt softened, it may be supposed, by the previous ablution. But as the absence of the soapy matter at the period when the dirt was deposited was the primary cause of the evil, we do not see how, in its absence, anything can replace it.

But cannot the yolk be artificially supplied? When a large running river is the medium of the wash, it will be impossible; but a small stream is often dammed up into a pond, in which they ars washed with but little overflow. In this case, a little soda, which is very cheap, will be of great value. A few stones of the common soda of commerce, dissolved in hot water, and poured into the pond or dam, will have a wonderful effect in supplying the deficiency of the yolk in the wool; and this is a course too obvious to be omitted by any flockmaster who has any regard for the superiority of his clip.

The probable deficiency of wool, from the Australian gold diggings absorbing the shepherd population and clippers, should be a spur to the British farmer to supply the deficiency as much as possible. And although the wool which more immediately supplies the place of Australian is

more the Southdown than the Cotswold, the Leicester, or the Teeswater, still wool of all kinds, as such, will doubtless be scarcer than the interests of the manufacturers require; and hence it is the duty, as well as the advantage, to have as much care as possible bestowed on the wool, to bring to market as much as possible to supply the wants of the market. An ill-coloured dirty wool from the animal's back will uncommonly ill replace the fine and silky wools of Australia, but it will be more or less useful to the manufacturer threatened with scarcity.—Gardeners' and Farmers' Journal.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

FRANCE.—No. XXII.

THE CAMARGUE—ITS RICE PLANTATIONS AND WILD CATTLE.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

I have already mentioned the Camargue as constituting the western portion of the great plain through which the Rhone debouches on the Mediterranean and I have contrasted its humid and swampy features with the dry aridity of the Craue. The boundaries of the former tract are easily fixed. About a mile above Arles the Rhone divides into two principal branches—the main stream flowing southward and eastward to the sea; the smaller, or *Petite Rhone*, inclining to the westward, and embracing a wide sweep of country, ere it falls into the Mediterranean some fifty miles west of the mouth of the larger stream. The island thus formed is strictly the Camargue. The country, however, near the sea, to the east of the Rhone proper, and to the west of the Little Rhone, preserves the features of the actual delta; and the latter tract, interspersed with salt ponds, lagoons, and marshes, is known as the *Petite Camargue*. The Camargue may be described as consisting of about one-third land, one-third water, and one-third marsh, of so amphibious a character as to be neither land nor water. The soil is, of course, almost perfectly level, dipping, however, with an imperceptible slope towards the sea; so that the further south you go the more wet and swampy becomes the ground, until at length, from tolerably firm clay and loam, it fades away into morasses and jungles of water-weeds, and finally becomes a labyrinth of banks, islands, peninsulas, and headlands, lacing the coast of the Mediterranean—the most tortuous and puzzling ponds, lakes, firths, bays, lagoons, and gulfs of salt water, stretching and winding inland, among swamps covered over with impenetrable jungles of huge water-weeds, long narrow stripes of rank herbage, and deserts of sand, overspread with a stunted, prickly red plant, called locally the "tariska," and frequently, after a hot summer's-day, encrusted with a white coating of pure salt. The principal lake of the Camargue is called the Etang des Valcare. It is a vast shallow muddy pool, studded with low islands and surrounded by swamps. The region which I have sketched is, as may be imagined, an uninviting and dreary one—so much so indeed, that, although its extent cannot but embrace three or four hundred square miles, it possesses but two or three miserable fever-haunted villages, the principal of which, *Les Saintes Maries*, lies near the sea, at the mouth of the Petite Rhone. For all this, however, the Camargue is, agriculturally, a district full of interest. In soil, climate, and productions, it is rather African or Asiatic than European: and the agriculture practised comprises savage customs which one would hardly expect to find yet lurking in Christendom.

I have sketched the odd features of difference between the Camargue and the Craue—the incessant irrigation of the one, the incessant drainage of the other. The main portion of the Camargue is a little Holland, defended from the water by huge dykes. On either side the Rhone runs fully as high as, and the river be at all flooded, higher than, the general level of the land; while in front the sea is kept out, partly by artificial mounds, partly by the sand and shingle barrier which its own waves throw up. The almost utter absence of stones on the Camargue is one of its curious characteristics. There is many a square mile in which you could with difficulty find a dozen of the minutest pebbles. You would trudge from black rich loam to stiff wet clay, over tracts of bog, and wastes of livid liver-coloured sand—a ghastly looking sort of soil—and find nothing beneath your feet harder than clods, burnt dry and powdery by the sun. The result upon the roads, when rain does come down, may be imagined. A few hours' wet seems to turn them into dreary tracts of clotted and tenacious mud, through which a heavy wheeled carriage has the greatest difficulty in clearing its way. During the latter part of the winter neither gig nor cart can adventure forth; the roads then become canals; the drainage of the field oozes into them; the ditches on either side overflow, and the only means of communication is on horseback, the animal floundering for miles together, belly deep, in mire and water. The upper portion of the Camargue is almost entirely ploughed land, bearing, with imperfect tillage, good crops of wheat, oats, and haricot-beans. Vines, although little suited to the nature of the soil, grow in the more sandy portions, and furnish the rough full-bodied wine which is used in the country. The water in common use is excessively hard, and is regarded as being the cause of fever. There are no such things as springs, except salt or brackish ones, to be found; and the palatable water is either that brought, at considerable expense, from either branch of the Rhone—and hard, muddy stuff it is—or that which flows through the ditches, partly the surface drainage, partly the oozings of the distant river.

The grand agricultural features of the Camargue are, however, its rice plantations, and its herds of wild cattle—bulls and cows, and white horses. The upper portion of the plain may be described as mainly arable—a patch of natural meadow land here and there intervening, with strips and sometimes wastes of sand, furze, and prickly heath. The medium portion towards the sea —the general level of which is lower, and the earth more saturated with water—is the belt best fitted for the cultivation of rice; vast quantities of which are grown by the companies recently established—one of them by the way, partially set in motion by English capital and managed by an Englishman—while the swampy labyrinths of pasture land lying among the pools near the sea afford rich and rank grazing for the wild cattle in question. I was anxious to see some of the latter in their native solitudes; but as I found that days of wandering through swamp and bog might possibly have to be gone through ere a satisfactory view could be obtained of either horses or horned cattle, I was fain to be content with inspecting three young cows of the breed in the *abattoir* at Arles, and picking up as much information as possible respecting the curious class of animals in question. The rice plantations were of more easy access, and to the principal of these—the large estate of *Chateau d'Avignon*—I made my way from Arles.

The property embraces some twelve or fifteen square miles, stretching back and along the banks of the Little Rhone in the lower portion of its course. The road—the condition of which after rain, and as it was when I traversed it, I have already described—proceeds through the principal corn districts of the Camargue. Right and left the country spreads out into enormous flat fields, occasionally traversed by stunted hedges and rows of hard wood and willow trees, all bent and distorted by the fury of the mistral. Ploughed and stubble land lying fallow, commons of sandy clay overgrown with prickly bushes, and stripes and patches of natural grass land, alternate around. On the pasture, and sometimes in the fallow, considerable flocks of sheep were feeding, each attended by a red-mantled shepherd. These animals seem to be kept principally for the sake of their manure. The breed is small and unprofitable, and no efforts are made to improve it. The lambs and wool are bought yearly by agents who go from farm to farm for the purpose. The former fetch from four to seven francs, according to their age; the price of the fleeces averages from one and a half to two francs. Unless when enclosed in a moveable fold, these sheep are generally brought home to the farm-yard at night, and penned up in large wattled structures entirely formed of wood, woven reeds, and branches: the walls are low, not more than four or five feet in height, so that the erections look entirely roof. A proportion of the sheep feed in summer upon the Piedmontese Alps, and also find winter grazings in the Camargue, where the salt-flavoured herbage agrees well with them. In my trip to the Chateau d'Avignon I overtook many flocks proceeding to their winter quarters. The ewes had lambed to a great extent, and the youngest and most delicate of their offspring were being carried comfortably along tied to the pack-saddles of the donkeys, who as usual led the troop. The price of grazing is, I am informed, similar to that which I have stated as existing in the Crau.

The land is partially, but by no means perfectly drained. At intervals of a mile or two, the principal drains or ditches cross the road—many of them considerable fosses, three or four feet broad at the surface of the water, and a few of the largest class as big as ordinary navigable canals. Through each and all a sluggish current flows seaward. These large or main ditches are made at the expense of the commune; the subsidiary fosses being dug of course by the proprietors of the soil, who have always an outlet for the perfect drying of their land, if they choose to go to the necessary expense. The communes keep, I was told, a regular corps of cantonniers, to attend to the public drains; but the smaller and private ditches are comparatively few, and inadequate to the drainage of so great an expanse of spongy soil. Sluices and reservoirs may here and there be seen, intended for the flooding of artificial meadows, the practice having been introduced from the Crau. I did not hear, however, that it had made much way.

The farm-houses of the Camargue are large, gaunt structures, generally far apart, the land being for the most part divided into large portions—often upwards of 600 acres each. Many of the steadings in question appeared to be formed out of dismantled chateaux and desecrated churches—the massive towers and crumbling belfrys rising above the clusters of mean farm buildings with which they were surrounded. The ordinary plan of laying out a farm-house hereabouts, is to erect a large plain shell of a square building of stone. About one-third or one-fourth of this is appropiated to the living rooms of the family. The outer door is always overshaded by trellis-work of vines. The other and larger portion of the building contains the vast shady stables and cart-houses common in the south. According to the number of sheep, pigs, and other live stock, outhouses are erected round the principal building, invariably composed, as I have hinted, of wattlework supported upon wood. The space between the buildings and the farm roads for some distance is pretty sure to be littered with reeds cut from the nearest marsh, and laid out to be trampled into manure. A clump of portly old trees is often dispersed round the whole.

The key to Camargue farming may be given in few words. It consists of an unbroken routine of alternate grain crops and fallow, the sheep being partly fed upon the natural meadows and commons, and partly—and as much as possible—upon the stubble land in repose for the next crop, and on which a tolerable harvest of juicy weeds and wild grass always springs up. I am told that nothing is more rare than any attempt either to break through the ordinary routine of operation, or to change the quantity of soil laid out as corn, grass, and common land. A Camargue farm is generally so situated as to comprise about one-third of arable ground the remainder being composed of pasturage, common, and swamp. Much of the latter could no doubt be reclaimed; but as the farmer has the land handed to him, so invariably does he hand it

back again. The spirit of energy and improvement visible in the Craue has not as yet decended upon the Camargue—always with the exception of the rice plantations which I shall presently describe. The number of metayers is small, but this tenure is not unknown. The greater portion of the cultivators, however, pay a fixed yearly rent; much of the common, swampy ground being held at as low a price as one or two francs per hectare, the more valuable portion being rented at from 15f. to 30f or 40f, Leases are common: they confer the holdings for periods of six, eight, or ten years, and are often full of stipulations and conventions, amounting merely to a recapitulation of the mode of culture practised in the district, and which the farmer is bound not to depart from. In other cases the land is held upon word-of-mouth agreement, the conventions and stipulations in question being perfectly understood on both sides. The proprietors of the Camargue never live upon and seldom come near their estates, so that the farmer invariably occupies the campagne, or mansion. The prevalence of fever in the summer months is the usual plea for the systematic absence and neglect of the landlord. The fever in question is seldom, however, fatal; but it is harassing and weakening, and in some constitutions necessitates an absolute change of climate. The malady is a species of intermittent fever and ague recurring ever alternate or every third day. It frequently lingers in the system with more or less virulence, according to the season, for as much as a year before the patient becomes acclimatised, and conquers the unpleasant tendency of the miasma. Few or no settlers in the Camargue escape a seasoning—generally in the first summer or autumn of their residence. Unwholesome, however, as is the district, I could see no particular appearance of bad health in the aspect of the peasants, who are the same sun-burnt, black-eyed, and bristly-bearded generation as all their brethren in the south. To return for a moment to the farmers. Comparatively large as are the rents which many of them pay, they are one and all mere ignorant peasants, often speaking little save patois, which hereabouts bears the same resemblance to Italian as that of the Pyrenean valleys does to Spanish; eating with their servants, and in short, perfectly upon a level with mere plough-men and carters. The country is thinly peopled, and farm-work is, except at harvest, performed exclusively by servants hired by the year, the number of small proprietors being very trifling. Of the farm servants the shepherd and the men in charge of the carts are the principal, receiving from 300f. to 400f. and their food—four meals a day in summer, and three in winter—the fare being, as usual, mainly made up of messes of vegetables, soups, stews of pork or bacon, and not unfrequently, in this part of the world, strong rank salt cod. The marshes and canals yield slimy flat-fish and eels, which help to furnish forth the country table, while semi-eatable sea birds, flamingos in especial, great flocks of these frequenting the coast—are consigned, when they can be knocked over or caught in traps, to the *pot au feu.* In winter the countless flocks of wild ducks, which resort to the marshes, furnish abundance of fishy, rancid flesh, which is, however, by no means disdained; and all these dainty dishes are very often dressed up with snail sauce—a luxury not uncommon in the South of France, and hereabouts, I am told, especially in request.

In the drive from Arles to the Chateau d'Avignon, a distance of near 20 miles, comprising views of great extent, over ranges of flat fenny country, I did not see, I should think, above half a dozen cottages, and the majority of these were clustered together at one particular point. They were more of the wigwam nature than anything one would expect to find in Europe—built in the same fashion as the sheep cots, and outhouses of the larger farms, entirely of wattle or hurdle work, roofed with layers of reeds from the swamps. There was a savage look about these habitations which in some sort was increased by the exceeding neatness of the handiwork which had woven together the walls and laid the rushes for the roofs, putting one in mind of the specimens of workmanship which one sees from the South Sea Islands. These cottages were almost invariably circular, and boasted of no windows whatever. The door, at least that which was in use during the day—invariably constructed in what would be the lee side of the cottage during the mistral—was composed of a coarse sheet of canvas, often festooned up so as to expose to view the single round chamber inside, littered with humble furniture and farm utensils. In several of these botheys there were stone chimneys; and altogether, miserable as were their materials, there was not wanting an air of snugness, derived perhaps from the neat handiwork of their builders, to commend them. The round and pointed roof was always surmounted by a rude cross. If the cottage, instead of being circular, is oblong, the cross always decorates the windward end. The inhabitants of these rush-built dwellings were persons renting, at very low rates, patches of communal ground in which they grew sorry harvests of oats and buckwheat. The land they tilled was sandy clay, reclaimed by themselves and fenced with brushwood. I saw a portion of the cultivating process going forward—a tiny morsel of a donkey dragging a wooden plough through the soil, one man holding the single stilt, and two others following with *beches* to deepen and complete the mere scratched-up furrow.

Approaching the territory of the Chateau d'Avignon, you see, upon three far distant points of the horizon, three factory-like chimneys pointing to the clear blue sky. These appertain to the three engine houses by which the water of the little Rhone is pumped from its bed, and flung over the rice beds. When the river is tolerably high, the services of the engines are not required; but as in the long summer droughts the stream shrinks to scanty dimensions, and as rice requires to be kept constantly soaked in water, the use of machinery is found to be indispensable. The plant in question is, indeed, to all intents and purposes, aquatic. With the exception of reaping time, and the small interval which elapses ere the earth be ploughed, and the seed again deposited in the ground, the rice fields are mere sheets of water, out of which the herb shoots richly. Ere the Chateau d'Avignon Company took up the speculation, the great expanses of flat which are now covered with their *rizières*

were deserts of morass, overgrown with jungles of fen, huge bulrushes, and all manner of rank, slimy, half putrid vegetation. Amid these swamps fed vast herds of wild cattle, all of which, when the property was purchased, had to be got rid of for what they would fetch. The company then proceeded vigorously with their operations. The Chateau d'Avignon—a massive old house, built by a receiver-general of the time of Louis Quinze—was their head quarters; the offices and director's residence being placed there, surrounded at some little distance by the principal establishments for the farm servants, mills for thrashing and clearing the grain from the husk, and the main pumping establishments supplying the great canal. The germ of this canal had previously, I believe, existed for drainage purposes. It is now put to quite a different use—that of flinging on the land even more water than it was originally blessed with.

Vast as is the quantity of irrigational moisture always required by rice, fully double the amount was in the present case necessary. In Italy it is calculated that about 3½ metres, or nearly 12 feet deep of water, are annually poured upon a rice field. In the Camargue, not only had this ordinary quantum to be provided, but as much again was requisite for the purpose of counteracting the effect, and sweeping away the particles of salt brought by the power of evaporation to the surface of the soil. The saline nature of the ground is, in effect, one of the great hindrances to the profitable cultivation of the Camargue; and in the case either of rice or wheat, different expedients to get over the difficulty have to be made use of. So long as the salt lies in moisture beneath the roots of grain, no harm is done; but the wet, evaporating, carries up the saline particles dissolved in it, enters into and corrupts the sap of such tender vegetation as grass and corn, or clogs the surface with an incrustation in which no wholesome or kindly plant can thrive or live. In the case of wheat the remedy resorted to is simple. After the seed has been placed in the ground, the field is strewed over with abundance of straw, the litter being most thickly laid down in the spots where the farmer's experience tells him that the ground is most affected by the oozings of the sea. This covering shelters the earth from the power of the solar rays, and evaporation to any great extent is prevented. As the young corn begins to sprout out through the straw, the shelter afforded is of course increased; and, as the crop progresses and advances to ripeness, the straw rotting forms manure and nourishment to the harvest which it first protected. The method is simple, but is said to be tolerably efficacious.

In the case of rice, as I have said, the treatment pursued is different—copious floods of water being employed to dilute to harmlessness, or carry clean away, the pungent particles. The double necessity, therefore for canals, ditches, and forcing pumps will be apparent. Collecting, then, all their agricultural forces, the company proceeded to clear away vast portions of the mass of rushes and wild water plants which formed the useless harvest of their domain. Ditches, with corresponding dykes and sluices, were everywhere run backwards and forwards over the land, mapping it out into square tables or patches, each so managed as to be under easy control, and capable of being flooded and drained at pleasure. The aspect of this rice wilderness is, as may be conceived, particularly after harvest time, wild and dismal in the extreme. Standing in or near the central part of the property you see spreading for dozens of miles around you a putrid-looking, black waste, dotted here and there at great distances by scraggy rows of half drowned poplars or pollard willows, running in dismal single file from one point of the horizon to another and marking the course of some main canal or feeder. Here and there the eye catches the dusky masses of far-away structures of woodwork and thatch—brown lifeless-looking spots—the district farm houses and storing places of the company. All round you perceive a labyrinth of raised dykes, affording a crumbling footing, intersected here and there by a muddy cross road, repaired by means of branches flung across it in the mire; and between these dykes and cross roads the rice fields themselves, on a lower level—shallow excavations, in fact, they appear, some of them dry; the coarse white stubble growing in clumps and clusters from the black hardened mud. Others—those which have been already ploughed, and sown for the next harvest—are shining sheets of still, muddy water, having gradually overflowed as the *drumly* fluid gurgles lazily through a sluice or aperture in the dyke, and disposes itself on the fat rank soil. Beds of enormous bulrushes and weeds, "twisted and knotted like water snakes"—foul, fungous looking growths, putting one in mind of the description of rotting vegetation in the "Sensitive Plant"—flourish in patches, and along the fat sluggish canals; while the only appearance of human life is when the eye catches the distant form of a solitary labourer in coarse greyish-brown clothes, the colour of the clayey mud, and great boots reaching up to his thighs, regulating the flow of water from the ditches into the *rizieres*. A more expulsive looking landscape I never looked upon.

Rice, unlike corn, is grown year after year without the soil requiring any other aid than that which it obtains from unlimited supplies of muddy water rendered more than lukewarm by the fierceness of the sun. Five succesive years is a common period in which to raise rice when the ground is naturally suited to it. The Chateau d'Avignon Company are at present only at their third crop; but their plan of management includes an occasional rotation of harvest. Thus several fields were pointed out to me which had borne rice the previous year, and which were, when I saw them, ploughed for wheat. The facility with which water can be thrown *off* as well as *on* any individual patch of land favours this system, and I was told that the wheat crops produced were excellent. The work, except about harvest time, when an army of auxiliaries are called in, is performed by the regular servants of the company, nearly all unmarried men. They are distributed over the estate in large farm houses placed at convenient points, and kept by a married couple, the wife having the charge of the meals of the labourers and the general household matters. I visited and inspected two of these little agricultu-

ral barracks. One was a lone dreary station far in the heart of the rice marshes, on the banks of the great canal, which, by the way, seems as much a navigable river as an irrigating ditch. The settlement was composed of three buildings—large barn-looking structures, each composed of wood and wattlework with thatched roofs. One was for the pigs, numbers of which are reared—a thin, long-legged lanky race, almost entirely for home consumption; and the second was the cattle stable a very spacious and well ventilated shed, provided with abundant litter, and having racks furnished with chopped straw, running along either side from one end to the other. There were at least a couple of score of oxen in this vast *hangar*, all of them comfortably couched upon the litter. They were partly ploughing oxen, and partly animals for fattening and sale. The prices which they fetched varied from 600 to 800 francs. The breed, however, was a bad one for the shambles—rough in the hide and big in the bone. Besides chopped rice-straw and hay, the animals had oil-cake; but none of them appeared to me to be in more than tolerable condition, at the very best. Next to the cow-shed was the living and tool house. It contained one large, and two small apartments; the latter filled with such stores as haricots, onions, garlic, bacon, and salt cod—with the minor class of farm implements, properly arranged. The large room had the usual vast peasant chimney—a long table, with benches for eating, on one side; ranges of dressers and rough kitchen furniture on the other. The general aspect of the place was primitive in the simplicity of its garniture, but cleanly and airy. A rudely coloured wood-cut or two were pasted on the beams of the wooden wall. The floor was of hard stamped earth. Three or four men discussing their dinners—vegetable messes with bread and soup—had abundance of wine in coarse earthenware jugs, each holding at least a couple of quarts. The room up-stairs—the general sleeping-place—was enclosed by the slanting walls of the roof, the heath and reeds of the thatch showing between the rafters. The beds were decent-looking pallets enough, with sufficient bed-clothes; and altogether the place was not uncomfortable, but dreary-looking in its forlorn desolateness of situation, and the want of anything like the family bustle of a large farm establishment. Outside, a row of good ploughs English made, was drawn up. The rice at this station is thrashed by driving horses over the sheaves in a manner I shall explain presently. At the central establishment the grain is separated from the straw by steam-thrashing machines. I do not know anything more curiously indicating the extremes of agricultural progress which you find in this part of the country—in which science and capital have all at once leaped, as it were, fully grown and armed, into the centre of ignorance and rudeness—than the fact I have stated, that on this one estate which I am describing, the grain is thrashed in one locality by galloping troops of wild horses over it, and in another by steam driving mills made in the manufactory of Messrs. Ransome, of Ipswich!

I have said that the company of the Chateau d'Avignon estate are as yet only at their third harvest. The enterprise is therefore still in the nature of an experiment, and as yet no positive commercial result can be said to have been established. The company had many difficulties to encounter—much to teach, and also much to learn. The outlay upon machinery and irrigating works was immense. Italian rice growers had to be imported to instruct the native population; the practical qualities of the soil, its peculiarities and anomalies, had to be studied, harvest after harvest, and the modes of culture adopted in other parts of the world to be altered and varied to suit the capabilities of the new rice-growing district. I believe, however, that the management at the Chateau d'Avignon now see their way to the full and satisfactory accomplishment of a great agricultural achievement, and to the accomplishment also of as full and satisfactory a commercial success.

The wild cattle form the second main agricultural feature of the Camargue. Their range, as I have said, is confined to the seaboard; and the labyrinth of promontories, peninsulas, necks and stripes of land, dividing the salt lagoons and marshes into the fantastic and capricious shapes in which they appear. Wild as these cattle are called, they are not so wild as not to have proprietors. Each estate, or large farm, in the lower portion of the Camargue, has attached to it a range of marsh pasture land, on which wild horses and cows feed amicably. The former are invariably perfectly white—the latter, nearly as invariably perfectly black, except perhaps a few which may be fawn-coloured. These flocks are attended not by shepherds, but by men called *gardiens*, one or more of whom, according to its extent, watch every flock, The *gardiens* are always capitally mounted upon the best Camargue steeds, and are admirable horsemen. From the saddle, which they are in from morning till night, hangs a coil of noosed rope, a lasso in fact; and each *gardien* is armed with a trident or three-pronged spear with a light strong shaft some eight or ten feet in length. Thus equipped the functionary in question starts upon his duties, patrolling the marshes, every square acre of which he must be acquainted with, keeping the herds of his proprietor withing their due bounds, chasing out intruders, rescuing the cattle stuck in the morasses—no very unfrequent occurrence—and generally performing such shepherd-like duties as can be rendered to so wild and unmanageable a flock. The business of a *gardien* of the wild cattle of the Camargue is one which, to ensure efficiency, must be followed from youth; the natural consequence is, that the occupation is all but hereditary.

The heavy limbed peasants who wield the beche, or hold the plough, never dream of becoming the accomplished cavaliers and the dexterous lasso men required to cope with a Camargue wild bull. In perfect horsemanship, intimate acquaintance with the habits and the mode of fighting of the creatures whom they have to manage—in trained coolness of brain, quickness of eye, and steadiness of hand, I am told that these *gardiens* rival the taureadores of Spain. Their knowledge of the morasses is wonderful. With their long lance-like tridents held erect—or perhaps now and then dug into the reeking flanks of a bellowing troop of cows, rushing madly on in front—the *gardien* of the Camargue,

driving hither and thither his master's cattle, must be no bad imitation of the old Scottish moss-trooper, pricking his way through Border swamps with a score or so of Cumberland black cattle lowing before him. The Frenchman, however, is an honest farm servant, mounted by his master, and gaining a house and good wages—about a third above those of the best *garçons de ferme*—by his adroit and manly toil. When a bull or cow is stuck fast in a bog, a cast of the lasso round the horns, and the efforts of the horse, who understands his business just as well as his rider, generally suffice to drag the roaring *detenu* out of the reluctant mud. Cattle are still, however, sometimes suffocated in the fathomless sloughs. Every spring the calves are branded on the hind quarters with the initials of their proprietors' names. The occasion forms the yearly festival of the Basse Camargue. The landlord or farmer invites his friends and neighbours to a convenient spot fixed upon among the marshes. Tents and marquees are erected; mules and donkeys laden with provisions garnish them handsomely; and for once in the year the solitude of these dismal swamps is broken by the merry clamours of the junketing party. Meantime the *gardiens* have been at work, charging the herds with levelled lances, like so many Paladins, separating the calves from their dams, flinging the lasso over the horns of the former, and dragging them struggling and roaring to the camp, where they are picqueted in lines. When a sufficient number has been collected, the branding operation commences Each calf is disengaged from his toils in succession, and led up to the fire at which the irons are heating. A strong-muscled *gardien* takes him by the horns, and with one desperate wrench flings him over on his side. In a moment the fiery stamp is applied to the creature's hide. Up he leaps with the instinct of sudden pain. A bound and a roar, and he is careering towards his marshy solitudes again—stamped, however, as property for the rest of his days.

Generally at about three years of age, the wild cattle are consigned to the butcher. The *gardiens* select the fattest of the herd, and by dint of good horsemanship and skill with their tridents separate the fatted beasts from the flock, and drive them, as may be believed, with many delays and many detours occasioned by the escapades of the cattle—to the slaughter-houses of Sainte Marie or Arles. Two or three *gardiens* are generally sufficient force to drive from half-a-dozen to a dozen wild bulls and cows before them, the sharp prongs of the tridents being the persuaders used to make the animals advance. In cases of determined recalcitrance the lasso is sometimes flung over the neck of the culprit, and he has his choice of moving on or of being throttled. Occasionally the milder inducement of an ordinary tame ox or cow is resorted to, the wild animals generally following it with sufficient docility. At the abattoir at Arles I saw three young Camargue cows, which had just been driven up by their *gardiens*, and which were now for the first and the last time beneath a roof. They were small black cattle, very much resembling the mountain breed in the North of Scotland, excessively quick and fierce of eye, and moving rather like deer than with the usual heavy shuffling gait of creatures of the bovine family. The animals were confined together in a large, well littered, and unstalled stable close to the slaughtering place. Their savage instinct of terror was evidently throughly roused. With drooping heads, but keen glancing eyes, they stood with their muzzles together, occasionally butting nervously round and round their prison, and uttering short moans and grunts, evidently moved by both fear and wrath. At the fatal moment, the butcher approached them very cautiously with a strong noosed rope in his hand; one end of the cord being held by a crowd of amateurs of the slaughter-house—men, women, and children, who watched at the half open door. It was long before the man could fix his noose over the horns of any one of his victims. They slipped out of its folds, flung them aside, and sometimes made short rushes at their tormentor, who, however, took the matter very coolly, and merely stepped aside, when the animals would pause again, lash their sides with their tails, and gaze fixedly at him. At length the noose fell well over the horns of one of the three, and was in a moment pulled tight by the assistants, who forthwith proceeded by main strength to lug the unfortunate brute to his death, dragging him forward by jerks, while he plunged and roared, and lashed out with fore and hind hoofs. At last however, when hauled into the slaughter house, the creature became more ungovernable. It made mighty rushes hither and thither, was checked by the rope, flung off its legs and rolled over and over upon the pavement. In a pause of the animal's excitement, the crushing blow was struck, and repeated as it came to the ground. The slaughterman was then leisurely producing his knife, when up sprung the wretched beast again upon its legs, its coat bristling, and shaking in every limb. The butcher forthwith acted like a man of dicision. He caught up his hammer, leaped on the creature's back, and another blow finished the matter. The flesh of these wild cattle is tough and stringy, and fetches a lower price than that of oxen who have worked in the plough or cart. The creature I saw killed was not worth more than from 100 to 120 francs. Some attempts have been made, but unsuccessfully, to tame these wild cows so far as to induce them to permit themselves to be milked.

After witnessing the end of the poor little Camargue cow, I inspected the abattoir, which is quite new, and built with all the latest improvements. It is an admirably designed and kept establishment, covering three sides of a large square. The central and highest part of the building contains the slaughter place for large horned cattle, with the stables in which they are bestowed opening from the corners. The stone floor is so sloped that all the blood runs speedily away through gratings into drains beneath; and abundant machinery of ropes, pulleys, and windlasses is provided for the convenience of the butchers in cutting the animals up. The place is lighted from the glass roof of a square central tower above, round which, approached by stairs and galleries, are shops or store-houses, in which the butchers keep their hides, tallow, horns, and so forth. For this accommodation each of the tradesmen in

question pays eight francs per month. Below they have cupboards for keeping their tools. Separate apartments, furnished with pens in the vicinity, are provided for slaughtering sheep and pigs. In the death place of the cattle are furnaces, boilers, and stone troughs for scalding. The walls bristle with the necessary hooks for hanging up the meat, The place is kept beautifully clean, washed thoroughly out twice a day, and again after each deed of blood. The butchers using it are bound to kill the animals they bring within 24 hours after their arrival. The general practice is that the beasts are introduced late in the evening, when water is given to them, and killed early next morning. The slaughterman of an ox or cow claims the muzzle, entrails, and hoofs, as perquisites. The prices or rents paid by the butchers are as follow: For killing an ox, 3 francs; a cow, 2 francs; a calf, 1½ franc; a pig, ½ a franc; a sheep or a lamb, ¼ of a franc.

The horses of the Camargue are about the size of what we call Galloways, and, judging from the specimens I saw, they make good, sprightly roadsters. They have small well-set heads, and are altogether a pretty compact race of horses. These creatures, when caught young, are easily broken in, and even the veterans do not oppose any very stubborn resistance to the rough-rider. The handsomest of every flock are soon laid hold of for saddle horses—secured by the lasso pitched round their necks. Their principal duty, however, is the very primitive one of thrashing the corn. The operation always takes place in the open air, near the farmhouse. Sometimes a space is regularly paved with bricks for the purpose. This is the fashion followed at the out-lying stations of the Chateau d'Avignon estate. As often, however, the operation is performed upon a bit of the hardest and firmest ground which can be found. The *gardien* upon the appointed day drives up a troop of some ten or twelve horses, the creatures being usually pretty docile, unless any one attempts to mount them. The corn is then arranged round a ring, just like sawdust in a circus. The horses are haltered by long ropes; the manager of the proceeding takes his place in the centre of the ring; assistants, armed with whips for behoof of the horses, and wooden pitchforks to keep the corn in proper order, attend about, and some dozen or so of wild white horses are speedily plunging at a gallop round the ring. The indurance of the animals at this fatiguing work is, I am told, very remarkable. They keep it up all day, with the exception of an hour or so at noon, when they rest and have some water, hay and chopped straw, but never corn. At night they are turned loose, to ramble at their will; but they seldom stray far, and are easily found and brought back to the ring the next morning. From all this it will be seen that the horses of the Camargue can only be said to be wild in a partial and modified sense of the term. They are branded just like the horned cattle, and when broken in are invaluable coajutors to the *gardiens*, from their former acquaintance with all the hostile tricks of their old comrades of the pasture—the black bulls and cows.

Attached to each wind or water mill in this part of the world, as well in the Craue as in the Camargue is generally to be found a species of flat stone-paved terrace, surrounded by a low ridge of masonry, and sloping to a southerly exposure. The lower surrounding line of mason-work is broken here and there by gangways to allow the water to run off. Near this plateau is placed a large stone trough well supplied with water. The use of this apparatus is as follows: the farmers, after selling their best wheat, regularly keep the damaged and diseased portions—and smut hereabouts is very common—for home consumption. Before being ground, therefore, the healthy grain has to be separated from the rest. This is performed by flinging the whole into the trough in question; the damaged corn floats, and is skimmed of with edgeless sieves. The water is then drawn away, and the sound grains—which after they become saturated, sink—are removed in wheelbarrows with wire bottoms, and spread to dry on the terrace or plateau in question.

A CHALLENGE FOR THE NEXT KENT CATTLE SHOW.

Mr. Edwd. Beard, of Boughton Monchelsea, has the following statement respecting the show of Sussex-bred stock at the next Kent Cattle show: "It will be remembered that after the cattle-show dinner held December last, at the Corn Exchange, Maidstone, Mr. Neame (Selling) offered a challenge to show some Sussex-bred stock, of different ages, from a cow down to a calf, for any sum of money, with any member of the Kent Cattle Show, to be shown at the next show held at Maidstone; which challenge, it will also be remembered, I accepted at the time; but on entering into articles, found Mr. Neame to mean that no animal was to be shown only what was bred in the county, and consequently it ended only in smoke. But as that challenge was given publicly, and not understood by many of the members of the Kent Cattle Show, I now give this challenge publicly through your journal to Mr. Charles Neame, to show seven pure Sussex-bred animals, for £5 per head; every animal must have been in the possession of the exhibitor prior to the last cattle-show held at Maidstone, excepting the calves under one year old, which are to be bred by the owner; and the judges of the bullocks at the show to be the judges between Mr. Neame and myself, and that they shall give their award to the best animal, making especial allowance for age, &c.

No. 1. Best fat Sussex cow.
2. Best Sussex cow in calf.
3. Best Sussex heifer in calf, under 3-years old.
4. Best Sussex yearling heifer.
5. Best Sussex heifer calf.
6. Best Sussex bull calf.
7. Best Sussex yearling bull.

Should Mr. Neame still feel disposed to have everything his own way, and still make an objection to the two first, I will show the five latter with him, on the same terms, all of which are bred by myself.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 12th of May, Mr. Pusey, M.P., Trustee, in the Chair; when the following Lecture was delivered before the Members by Mr. Trimmer, the Author of the Society's Prize Essay on Agricultural Geology:

The True Relations of Geology to Agriculture form the subject on which I am to have the honour of addressing you to-day. There ought to be an intimate connexion between them—between the art of cultivating the earth, and the science which treats of the materials of which the earth's crust is composed and the order in which they are arranged. The connexion is often denied. It is denied, or doubted, however, only by those who know nothing of geology, or who have heard only of its theoretical researches. They have been told much about the wonders which it has revealed respecting the ancient natural history of the earth; but the mass of facts capable of application to the useful arts, and more especially to agriculture, have been kept of late too much out of sight by geologists. They may therefore thank themselves, if they are very generally regarded as a set of visionary enthusiasts, who go about the country, hammer in hand, collecting "curiosities" for museums, or breaking stones, as Walter Scott said, "like road-makers run daft." The earlier researches of geology were essentially practical. Werner applied his discoveries to mining; Smith, the father of English geology, applied his to mining, general engineering, and agriculture. Were I called upon to prove the services which geology can render to the art of cultivation, I might appeal to the many instances of its successful application by Smith. I presume, however, such an audience as this to be sufficiently aware of these facts; and I would rather draw your attention to the remarkable circumstance, that all these triumphs of applied geology were achieved by one man, in the infancy of the science, and that scarcely any thing of a similar kind has been effected by the many more highly-accomplished geologists who have succeeded him. This has been, not because the resources of geology are exhausted, but because the field has been neglected, or very imperfectly cultivated. Smith was a practical man, conversant with agriculture; of agricultural origin, the son of a yeoman farmer; agricultural in his occupation, which was that of a land-surveyor, engaged in surveying and valuing for enclosures, draining land, and forming water meadows. His practice extended also to the construction of canals (the railways of his day), and the superintendence of collieries—branches of engineering which now constitute separate departments, rarely followed conjointly by the same individual. The only professional men who have since cultivated geology have been engaged in mining: the Buddles, the Taylors, and the Sopwiths, who have cultivated it so successfully. Practical men who have Smith's opportunities of applying it to agriculture, have neglected it too much; and the majority of the geologists who have succeeded him have been naturalists and philosophers, occupied more with theoretical than practical questions. It may be as well to define, before we proceed, the sense in which I use the terms "practical geology," "applied geology," "theoretical geology," and "geology of the surface."

Practical or descriptive geology directs its researches to *facts*—to the structure of the earth's crust, the materials of which it is composed, the order in which they are arranged, the areas occupied by their several varieties, the unstratified rocks most commonly associated with certain parts of the stratified series, the useful metals and minerals peculiar to each, the changes which the intrusive igneous rocks have produced in the texture and composition of the strata with which they are in contact, the direction in which the strata dip, the angles at which they dip, the height to which they have been thrown up by disturbances which produced our chains of hills and mountains, the faults or fractures which have broken the continuity of the strata; with the other accidents to which they have been subject, and which affect the drainage of certain areas.

By *applied or economic geology* I mean the employment of the knowledge of these facts in aid of the miner, the engineer, the architect, and the farmer.

Theoretical or speculative geology investigates the *causes* of phenomena, and is occupied with such questions as the following: the processes by which the stratified and unstratified rocks were formed, the nature of the agencies by which they have been disturbed and altered, the successive races of plants and animals which have peopled the earth at different stages of its existence, their relations to existing races, the changes of climate which they indicate, the causes which produced those changes, and the causes which effected the extinction of the lost races—whether they died out one by one, or were cut off suddenly by physical convulsions; the geographical distribution of certain organic forms during the ancient periods of the earth's history, and the modes in which their migrations were effected in past geological epochs, as well as during the present.

The *geology of the surface* constitutes a department of the science hitherto much neglected, but of great importance to agriculture. It treats of the superficial deposits, formerly called diluvium, but now better known by the names of drifts or erratic tertiaries—deposits which are excluded from geological maps as at present constructed. This, like the geology of the substrata, may be divided into practical and theoretical. The former investigates the depth, composition, and distribution of the superficial deposits; the latter endeavours to discover the agencies which produced them.

Smith's great discovery that strata may be identified by their fossils under a complete change of mineral type,

was a discovery of great practical utility. It has contributed, nevertheless, to lead geologists away from practical to theoretical questions. It is, in effect, a discovery that there have been several successive creations of plants and animals before that creation of which man forms a part. Geologists have been fascinated by the wonders thus brought to light, and by the strange forms which they have disinterred from the depths of the earth. They have thus been led to pursue palæontology, or the science of ancient natural history, with such avidity that it has almost superseded geology, and has led many besides farmers to doubt whether there is anything practical in geology itself.

Geologists, moreover, have not only cultivated theoretical researches too exclusively; but, when they have endeavoured to apply their science to agriculture, they have applied them on erroneous principles. They have attempted to construct a system of agricultural geology, not upon soils, subsoils, and substrata, as they exist in nature, but upon the conventionalities of geological maps. Those maps exclude the superficial deposits; they sink the mineral variations of the strata which they represent as the surface, both those which take place vertically and those which take place horizontally; and they convey by their colours no other information than that within certain areas certain groups of clays, sandstones, and limestones are to be found, which contain a peculiar group of fossils not to be met with higher or lower in the series, and which remain constant, however the mineral characters of the beds containing them may change. These changes of mineral character are often so rapid and so great, that in a distance of one hundred miles, or even less, clay will have passed into sandstone on the one hand, and into limestone on the other. Let us illustrate this by one example—that of the greensand. A belt of bright green stretches across our geological maps, from the coast of Dorsetshire to the banks of the Humber. Another girdles the Weald of Kent and Sussex, at the base of the North and South Downs. These belts add much to the beauty of our maps. They have caused many an animated discussion at the Geological Society on questions now set at rest. They have afforded much sport to the fossil hunters, and have enriched their cabinets with many beautiful specimens. But what information do they convey to the owners and occupiers of the estates which lie within them? Merely that they are upon the greensand. And what is the greensand? It consists of an upper and lower sand separated by the gault, a calcareous clay. The upper sand is generally calcareous, passing upwards into the chalk, and downwards into the gault. The lower sand is chiefly ferruginous and siliceous, with concretions of cherty beds, and beds of calcareous stone. It also contains, locally, beds and nodules of phosphate of lime. This is the southern form of the greensand, but the upper greensand does not extend further to the north than Cambridgeshire, nor the lower greensand than Lincolnshire. In the latter county and in Yorkshire, the upper greensand is represented by red chalk containing greensand fossils; and at the northern termination of the chalk ranges in Yorkshire, the white chalk rests immediately on blue and green clay (Speeton clay) the upper portions of which represent the gault, and the lower the Kimmeridge clay. The majority of geological maps include the three subdivisions of the greensand under one colour. The maps of the Government Geological Survey distinguish them by different tints. Even these maps, however, excellent as they are, fail to convey any useful agricultural information; for they do not show the variations of soil on each subdivision, and the lower greensand alone includes the extremes of barrenness and fertility. As examples of fertility we have the rich grazing grounds of the Vale of Aylesbury, the valuable hop-grounds of Farnham and Maidstone, the celebrated gardens of Sandey and Biggleswade. As examples of sterility, there are Dersingham Heath, in Norfolk; Leith Hill and Hind Head, Surrey; with parts of Woolmer, and Alice Holt Forest, Hampshire. Similar examples might be adduced from most of the other groups of strata which our geological maps represent as constituting the surface. And yet we are told these maps represent the variations of soils, and that the agricultural characters of a district may be known by the bare inspection of them. Every intelligent farmer, who has paid any attention to strata and geological maps, knows that this is not the case. He knows that on every group of strata united by the possession of a common assemblage of fossils there are a great variety of soils of very different values. He knows that these are intermixed with the utmost irregularity, and he sees no traces of such variations on the maps respecting which he is told such wonders. Is it surprising, then, that farmers treat geology as a delusion or an imposture? Is it surprising that the question should have been lately raised in a farmers' club, whether a knowledge of geology is of any use to the farmer, and that it should have been decided in the negative? If properly cultivated, however—if directed to practical questions—and if made to combine the geology of the surface with that of the substrata—geology is of the utmost value to agriculture. Had I been present at this discussion, I should have met the question by a series of other questions. I should have asked, for instance, Is it of any advantage to the farmer to know anything of the *composition* and *qualities* of the soils and subsoils which he cultivates? All the discrepancies which prevail in the practice of different and often adjoining districts, and all the discordant results of agricultural experiments, are attributed to certain undefined mysterious peculiarities of soil and climate. Surely it would conduce much to the improvement of the art of cultivation to know in what these peculiarities consist. I would have asked, again—Is it of any advantage to the farmer to be able to *classify soils* and to *describe them* by names which shall be intelligible beyond his own immediate neighbourhood? What would conduce more to the improvement of agriculture than to obtain a knowledge of the most successful practices of the best cultivated districts, and to know which are capable of general, and which capable of only local application? But when farmers in different districts describe the successful or unsuccessful results of certain processes of cultivation or of certain manures, it is essential that we

should know whether the soils to which they are applied are the same or different. How can we know this, so long as they use names for them which convey no meaning, or names which convey a meaning the very reverse of that intended? They use names which convey no ideas beyond very limited districts, where they employ such provincial terms as redland, whiteland, blackland, woodland, woodcockland, deaf-land, rammel, foxbench, clum, clunch, cledge, keale, pinnock, hassock, stone shatter, malm rock, coombe, and blackhover, with many others, not forgetting bearsmuck. They use expressions which convey ideas the very reverse of those intended, when they employ the ordinary terms, sand, loam, and clay, in so vague and loose a manner, that what one man calls sand is the loam of another, and the clay of a third, as the soil described happens to be more or less tenacious than the average of a district in which strong or light soils prevail. I would have asked, again, whether it is of any advantage to the farmer, looking out for a farm, to know anything of the distribution of soils, that is to say, in what districts he may expect to find the most extensive tracts of land suited to his particular requirements, whether he wants strong wheat and bean land, light dry soils for stock farming on arable land, rich grazing land for the fattening of cattle, or ordinary pasture for the dairy and for rearing young stock. This is a kind of knowledge which most farmers consider it part of their business to acquire from personal opservation respecting their own immediate neighbourhood. They know the qualities of all the farms in their own and the adjoining parishes, under the system of cultivation to which they have been accustomed. They possess some general knowledge of the quality of the land in remoter portions of the district in which they reside, and to which their business occasionally leads them. However they may despise geology, they are thus unconsciously, and for a limited district, geologists. Agricultural geology merely combines and generalises the knowledge of other observers equally competent; and why should that be regarded as useful, practical knowledge so long as it is confined to a parish, or a county, and be scouted as "all theory" when it embraces many parishes and counties, or even takes a wider range, and investigates the agricultural capabilities of Australia and North America? Such knowledge is valuable to the farmer whose operations are confined to one locality, who, like the Vicar of Auburn, has "never changed, nor wish to change his place:" it is more valuable to the landowner whose property lies in different counties under different conditions of soil and climate; and to the land-agent, who frequently represents several such landowners, and whose business it is to develope to their full extent the property under his care. Such knowledge is valuable to the farmer in an old country: it is more valuable to the settler in a new country where cultivation is only commencing. The competition which arises from the consolidation of farms, and the increase of the farming class, both from within and by accessions from other classes from without, is driving many farmers and sons of farmers to look to new fields of enterprise in the British colonies and the United States. If it is advantageous to those who cannot make up their minds to emigrate, to know where they will find, within our own shores, land similar to that which they are leaving, and in the cultivation of which they have had the most experience: such knowledge is more valuable to a settler in a new country, where the quality of the soil cannot be known from the appearance of the crops, and where the spontaneous vegetation, being different from that to which the settler has been accustomed, cannot be relied upon as an indication of fertility, except after long observation. Geological structure, however, may be relied on, all the world over. The mineral characters of the rocks when free from a covering of transported matter, and the substances composing that covering when present, are indications of the agricultural capabilities of a country immediately and implicitly before a plough has been put into the ground, and while every plant which springs up on its surface is a stranger to the settler.

The lecturer then pointed out the connexion of geology with the three principal modes of improving land — draining, irrigation, and the use of mineral manures. The importance of geological knowledge to the success of operations, undertaken for the purpose of obtaining a supply of water by means of Artesian wells, was insisted on. Reference was made to Mr. Prestwich's work on the water-bearing strata round London, and to his plan for supplying the metropolis by means of deep Artesian wells carried down to the lower green sand, like that of Grenelle, near Paris. The importance of such wells, in an agricultural point of view, was also shown in the event of the extensive adoption of the use of liquid manure, one great impediment to which, in some situations, would be the want of water to dilute it sufficiently. The value of geological knowledge was next adverted to, in enabling the farmer (including in the term the landowner and land-agent) to decide questions which would often come before him; namely, where the best and cheapest materials for erecting farm buildings, filling drains, and repairing roads, were to be procured. Two extensive districts were pointed out, in which the greatest improvements, as well as economy, had resulted from the use of road materials brought from a distance of 100 miles; and, on the other hand, an instance was shown of wretched clay roads converted into good metalled roads by the discovery of beds of stone at an accessible depth in the Weald clay. Lastly, it was shown how geological structure affects the value of land by the non-agricultural employment to which it gives rise, the masses of population which it causes to congregate on certain localities, and the consequent demand created for agricultural produce. The three industrial districts of England dependent on geological structure were traced—the eastern or purely agricultural; the central or coal district, agricultural, manufacturing, and mining; and the western, a district of mines and mountain pasture. The agricultural characters of each district were referred to the joint influence of the stratified and unstratified rocks on the one hand, and the superficial deposits on the other. The order of suc-

cession, the dip and outcrops of the strata, were illustrated by a series of books laid in an inclined position. Their relation to the unstratified rocks which have disturbed them from their original horizontal condition were explained by means of a large root of mangold wurzel, against which the books leaned, and which represented the intrusive rocks forming the axis of a mountain chain. The distribution of the superficial deposits which form the loose covering of the rocks was represented by some wheat scattered irregularly over the books, thinnest on the slopes and summits, and deepest in the depressions between the hills. The superficial deposits, again, were described as of three classes—those produced by existing aqueous currents, acting at the present levels; those produced by marine currents, acting independently of existing levels and lines of drainage, and having power to transport large blocks hundreds of miles from their parent-rocks; and lastly, a class of deposits which indicate a less degree of transportaion, but which still acted irrespectively of present lines of drainage and levels, and have mixed and spread over the surface of hills and plains the materials of several adjoining formations.

If, continued the lecturer, we examine the agricultural character of any of these districts in detail, we shall find them to depend on three geological conditions--the mineral composition of the rocks; the height to which they have been thrown up by local disturbances; and the depth, composition, and distribution of the covering of transported matter. All soils are composed of the fragments of the stratified and unstratified rocks—either of the rocks immediately below, or the fragments of other rocks lying at various distances, which have been transported by currents of water now in action, or by currents which have ceased to act. The changes from heat to cold, from wet to dry, from frost to thaw, separate the particles of the hardest and most compact rocks. Some decompose more rapidly than others, but all crumble more or less. Now, if the crumbling matter derived from each rock remained on the rock from which it was derived, the composition of the soil would always be identical with that of the rock below. Sandstones would then invariably be covered with sandy soils; clays, shales, and clay-slates with clayey soils; and limestones with calcareous soils; and the only modifying influence would be that of elevation and aspect. But the fragmentary matter produced by the weathering of rocks does not remain on the spots where it is formed. The rains wash it into the brooks; the brooks convey it to the rivers; the rivers transport it to the sea. Wherever, from the diminished declivity of the river-bed, the current slackens, there the stream deposits the matter which it is hurrying along. The coarser fragments are deposited the nearest to their source in the form of gravel: particles of smaller size travel farther, and fall down as sand, while the finest particles are borne to the greatest distances to form silt and mud. In this way those rich alluvial flats which border our rivers have accumulated, when in seasons of flood the turbid waters overflow their ordinary channels, and leave a rich sediment behind them. Again, where the tide and the freshets meet near the mouths of rivers, a further deposit takes place. In this way have been formed those alluvial marshes near the mouths of the Humber, the Thames, and the Severn, many of which, from the human remains and works of art contained in them, must have been formed since the Roman invasion. Besides the soils produced by this drifting and mixing of the materials of different rocks along the existing lines of drainage, and at present levels, by causes still acting, there is another class of deposits of older date, which exhibit proofs of a much more extensive transportation by currents which have ceased to act, and which acted independently of the present lines of drainage. These currents had power to transport great blocks of stone weighing many tons, to points distant hundreds of miles from their parent rocks. In an essay in your Journal, which you recently honoured with your prize, I described these deposits in great detail; I described their distribution, depth, and composition, so far as it is known in the present neglected state of the geology of the surface; I described the heights to which they extend up our mountain chains, and the districts most free from them; I pointed out also the evidence of their having been formed beneath the sea by the submergence of the land, and of that sea having been an icy sea which overspread a large portion of the northern hemisphere. I will not go over that ground again, but will content myself with pointing out on the map as briefly as possible the different lines along which the transported matter has travelled, in order to impress you more strongly with the extent of these deposits, and the influence which they have exerted over large areas, in masking or modifying the characters which the rock immediately below would have imparted. I have thus pointed out five lines of drift north of the Thames influenced by the position of the mountains and hills:—1, That east of the chalk range; 2, that between the chalk and the oolitic chain; 3, that between the western escarpment of the oolites and the Penine chain—the great central chain of England; 4, that between the Penine chain and the Cotswolds on one side, and the Cambrian and Cumbrian chains on the other; 5, that on the western side of the Cambrian chain. I have shown also the interlacing of the different lines of drift, by the transport of detritus at certain points across the chains, so that fragments of granite and other well-defined rocks, easily recognized, have been carried from Cumberland to the shores of the German Ocean, and there blended with others from the east of Scotland and Norway. I have shown how fragments of the red chalk of Yorkshire and Lincolnshire have been carried to Moreton-in-the-Marsh, and there mixed with peculiar pebbles derived from the Bromsgrove Lickey, and spread over the midland counties. These quartz pebbles have also been carried across depressions in the oolitic range into the valley of the Thames, and the gravel-pits of Hyde Park; while fragments of the peculiar chalk of the county of Antrim have been transported, in Ireland, as far south as Wexford, and across the bed of the Irish Channel to Carnarvonshire and Pembrokeshire.

The district south of the Thames must be considered separately. It is extensively covered with superficial accumulations, but they are of a different kind. Besides the marine strata which were formed on the bed of the erratic sea, there is another class of superficial deposits, which is only beginning to excite the attention which they deserve, and which have exercised an important influence on the distribution of soils. There are certain districts, both on our own island and on the continent, in which we find no traces of the erratic tertiaries, but which appear to have been subject to aqueous operations of some kind or other, which have produced a certain degree of local transport different from the effects of ordinary marine action, different from ordinary atmospheric action, and different from that peculiar marine action which is characteristic of the erratic tertiaries. They consist of thin deposits of clay, loam, and sand, containing angular fragments of the subjacent and neighbouring rocks. They are spread irregularly over the surface, being deepest and most free from coarse fragments on the plains; thinner and more mixed with them on the slopes and flat summits of hills; entirely absent from steep sides and sharp ridges. They appear to have been formed subsequently to the desiccation of the bed of the erratic sea, for they are spread (when the two deposits are present in the same district) over its denuded surface. In the meantime, England appears to have been repeopled, by many of the species of land animals now extinct, which lived there before the erratic submergence. Whenever shells are found associated with these deposits, which are chiefly those of the land and fresh water, they belong to existing species, and with one or two exceptions, to the very species now inhabiting the neighbourhood. These deposits containing angular detritus, and their effect on the variations of soil, were first described by me in your *Journal*, as they exist in Norfolk. Subsequently, in a paper yet unpublished, which was written five years since, at the request of Sir Henry De la Beche, for the Memoirs of the Government Geological Society, I described them as they exist in South Wales: and in the Journal of the Geological Society for last year, I described them as they exist in North Kent. I called them "warp." They have since been described by Mr. Austen for Devonshire, under the name of "head;" and by Sir R. Murchison and Mr. Prestwich, for Sussex and the neighbourhood of Calais. Sir R. Murchison calls them "angular flint-drift." Of the nature of the agencies which produced them we know nothing; and I will not detain you by enumerating the conflicting opinions which prevail on that subject. The points of agricultural interest are their existence, their extensive distribution, and their influence on the variations of soils. These facts are quite independent of theories regarding their origin. The district south of the Thames is one in which we have no traces of the most peculiar of the erratic deposits—the till, boulder clay, or lower erratics—though it comes down to the north side of London. There are, however, some beds of partially-rolled gravel, which I think may be a modification of the upper erratics of the district north of the Thames, overlapping the lower. Be this as it may, these beds of gravel are extensively distributed, varying in their maximum depth from fifteen to thirty feet. But the greater portion of the superficial deposits in that region consist of that "warp" or "angular flint-drift," which exhibits a certain amount of mixing of the materials of more than one formation, but not so great a degree of transport as the erratic tertiaries. This angular drifted matter is spread indifferently over flat-topped hills, over their long slopes, and over plains, on which last it is the deepest. The coloured section of a road-cutting near Hartley Rectory (for the use of which I am indebted to the kindness of the Council of the Geological Society) exhibits this deposit as it exists on the chalk of North Kent. A diagram of it was repeated, by their permission, in your Journal. For the two other coloured sections, I have to thank Sir Roderick Murchison, as well as the Council of the Geological Society. They exhibit two instances of this deposit; in one case on the chalk of Shakespeare's cliff, in the other on the outcrops of the chalk and greensand near Folkstone. The Weald denudation, between the North and South Downs, enjoys the reputation of being a district wholly free from transported matter, and of being composed of soils derived exclusively from the rocks below. In the essay on the "Agricultural Geology of England and Wales" in your *Journal*, I expressed an opinion, founded on my own observation, that it contained more matter, indicating some degree of transport, than is generally supposed. In corroboration of this, I cited some notices of such deposits from Dr. Mantell's "Geology of the S.E. of England." These views have been since confirmed by two papers recently published by Sir R. Murchison and Mr. Martin, of Pulborough. From these it appears that the detritus of this district is arranged in east and west zones—that two of those zones are exterior to the escarpments of the chalk, both on the north and on the south, and two within the denudation of the weald which is bounded by them. The outermost of these exterior zones is described, by Mr. Martin, as composed of slightly worn flints mixed with many rolled pebbles, derived from the older tertiaries of the London clay series. These are the beds which I consider a modification of the upper erratics of the north of the Thames. That nearest to the chalk escarpment is described as composed either exclusively of angular and subangular flints, or of the same materials sparingly mixed near tertiary outliers with their rolled pebbles before mentioned. It is this which prevails on the chalk of the Sussex coast. The two zones within the chalk escarpment are called by Mr. Martin the subcretaceous and the wealden zones. In the subcretaceous zone there are many localities, both on the north and south of the central ridge of iron sand, covered with heaps of drifted and sharply fractured flints, mixed with chert, ironstone, and sandstone derived from the neighbouring and subjacent rocks. They fill hollows in the eroded surface, and are piled up in heaps at heights varying from thirty to three-hundred feet above the existing drainage. They are mixed with a few rounded pebbles, resembling those of the tertiary de-

posits. The lower chalk, the upper green sand, and the gault, which lie between the lower green sand and the chalk with flints, are generally free from this detritus, but a spread of flints occurs at intervals. From this Sir R. Murchison infers that they were not derived from the chalk escarpments on the north and south, but were transported by currents from the west, where the ranges of the North and South Downs unite. The transverse gorges by which the waters of the Weald escape northwards to the Thames and southwards to the sea, also contain considerable accumulations of clay, sand, and fragmentary chalk. With respect to the wealden zone of detritus, the slopes of the hills and the valleys of the really central ridge of iron-sand are described as destitute, or nearly so, of chalk-flints, or other extraneous fragments; but the valleys occasionally present thick accumulations of reaggregated clay or loam, derived from the adjoining hills. Sir R. Murchison notices the effect of these deposits in modifying the sterile character of the Weald clay by an admixture of loam, and also in producing the rich, arable plain of Little Hampton and Bognor, composed of the same materials as the thinner deposits on the higher slopes of the Downs, but mixed in different proportions. The flints which prevail on the hills are more sparingly mixed with loam and clay in the low grounds, where loam prevails; and between the thin deposits of the hills and the deep deposit of the plains, he declares that it is impossible to draw any line of separation. This is virtually identical with the statement I had previously made in your Journal and in the Journal of the Geological Society, as to the dependence of the variations of soils in Norfolk and North Kent on contours, and on the varying depth and composition of the "warp," *i. e.*, the "angular drift" Sir R. Murchison. I therefore hail with great satisfaction the accession of so powerful an ally. I have been engaged or five years in a struggle for the advancement of agricultural geology against those geologists who regard fossils as the all-in-all of their science, and whose speculative views respecting the distribution of plants and animals require that soils should be formed from the rocks on which they rest by the sole influence of atmospheric action. Those views prevent them from "recognising warp as a distinct deposit." It is now proved, however, on the evidence of some of our best field geologists, with Sir Roderick Murchison at their head, that by whatever name we call it, and however unable we may be to explain the causes which produced it, there is such a deposit, and that it exercises an important influence on the distribution of soils. It results, then, from the collection and generalisation of our present stock of facts respecting the superficial deposits, that there is scarcely a district in England and Wales exempt from some kind of transported matter, in which are blended the materials of more than one formation, when even the thinnest are of sufficient depth to form the soil, and in many cases the subsoil also. To be useful to agriculture, therefore, geological maps must include the geology of the surface as well as of the substrata. We must lay down soils and subsoils as they actually exist, and then determine their relations to the rocks beneath: not deduce the former hypothetically from the latter. Such maps may be of two kinds. We may have maps of estates on the large scale of the tithe maps. On these the variations of soil may be denoted by colours after a plan which I proposed about two years since. The depth of soil and subsoil, and of the substrata down to the rocks, which form the assumed surface of ordinary geological maps, may be indicated by a system of figures and of conventional signs. The mineral characters of the rocks may also be shown by words written along the strike—as sandstone, clay, limestone, &c. The fossiliferous group to which they belong, may be shown by words written in another character across the strike—as coal measures, lower greens sand, &c. From their minuteness of detail these maps would be of great practical utility, and could not fail, if executed by competent persons, to furnish much information respecting the agricultural capabilities of the property, and to lead to the development of dormant resources. They should always accompany, if not be preliminary to, draining operations. By combining the two the expense of the mapping will be reduced, since the trial holes necessary for the draining will give much of the information required for the maps. The remainder will be furnished in greater detail during the cutting of the drains. Inferior to these maps in practical utility, but more interesting to science—because they would condense and epitomise information which, on the larger scale, would be too much diffused for general and comprehensive views of the surface geology of large districts—would be the Ordnance sheets coloured like the map of Norfolk before you, to represent the variations of soil. These would be maps of the surface geology, as companions to the Government maps of the substrata. On a scale so small as that of the Ordnance maps it is impossible to combine the geology of the substrata with that of the surface: they must be shown by separate maps. On the larger maps of estates they may be exhibited together, by the plan indicated above. In illustration of these three methods of constructing geological maps, let us suppose the floor of this room to be composed of different kinds of wood—fir, oak, elm, mahogany, &c.—arranged alternately. These will represent the strata. The carpet which covers them will represent the superficial deposits, which comprise the soils and subsoils of agriculture, except where holes in the carpet expose the floor. By means of these holes, and of our knowledge of the strike of the strata, which is at right angles to their dip or inclination, and is here represented by the direction in which the planks lie, we obtain the data on which our geological maps are constructed. We represent the strata as they would be if the carpet were removed. Such maps, therefore, can convey very little information respecting soils and subsoils, unless accompanied by another map, showing their variation; that is to say, the pattern of the carpet. On the Ordnance sheets I give a separate plan of the carpet. The Government maps give a plan of the floor. On the larger maps of estates I purpose to exhibit the pattern, thickness, and composition of the carpet. By means of the mineral characters of the strata, written

along the strike, and of the fossiliferous groups to which they belong, written across the strike, I propose to render this map of the carpet transparent, so that he construction of the floor may be seen through it. In the outset of such an undertaking the want would be felt of a systematic nomenclature of soils, capable of general application. The authors of the reports to the Board of Agriculture complain repeatedly of the difficulty of describing soils, or of laying them down on maps, from the confusion existing as to nomenclature, as well as from the irregularity and intricacy of their distribution. Allow me to ask, how many of the local names which I enumerated in the early part of this address you understand? I would ask a Kentish man, what idea he attaches to the terms rammel, fox-bench, keale, and bears' muck; and on the other hand, I would ask a farmer from Lincolnshire, Northamptonshire, or Cheshire, what he supposes to be meant by pinnock, hassock, stone-schatter, cledge, and blackhover. Soils require a double classification—chemical and geological. The chemical classification would arrange them, and name them in conformity with their composition, dividing them into sands, sandy loams, loams, clay loams, clays, marls, calcareous and vegetable soils, according to the proportion of sand, separable by washing, of lime, and of vegetable matter which they contain. The geological classification would express their relations, on the one hand, to the rocks on which they rest, and on the other to the superficial deposits. I know of no system which would answer the purpose so well as that which divides them into alluvial, erratic, and local. Alluvial soils will be those formed as I have described by existing aqueous action along existing lines of drainage. Erratic soils will be those which were formed by currents which have ceased to act, and which acted irrespectively of the present drainage. Local soils will be those composed exclusively of the material of the rock on which they rest. Under this double classification we should have local, erratic, and alluvial sands, loams, and clays, &c., on the chalk, oolite, greensand, &c. These particulars, together with the depth and colour of the soil and the depth and composition of the subsoil, might be concisely expressed by signs and symbols in a manner which would convey more information than could be gained from whole lines of description, or from heaping together such epithets as fine, deep, rich, mellow, putrid loam—or poor, cold, sour, hungry, barren clay. Such information, with notices of the elevation and aspect of the land and its elevation, would be nearly all that is required to enable a judgment to be formed respecting the present quality of the soil, its future capabilities, and the available means of improvement. The test by which to discriminate between local and erratic soils, when the rock is covered only by a thin film of the latter, is this:—Do they, or do they not, contain any pebbles or fragments of stone which are not found in the rock below, and which could not have reached them by ordinary atmospheric action? If any coarse foreign detritus is present, we may be sure that it is present also in finer particles; and that the soil differs somewhat in composition from the subjacent rock. Tried by this test, I believe that local soils will be found extremely rare. To establish such a system we should require the co-operation of many agricultural surveyors conversant with soils to map their variations on different geological formations; they should act in conjunction with a central body of agriculturists, chemists, and geologists, in order to insure uniformity of colours, signs, and nomenclature. A systematic study and classification of soils such as this is intimately connected with those researches which Professor Way is carrying on with so much success respecting the absorptive powers of soils. Is it too much to hope that some of the most perplexing anomalies of agricultural practice and agricultural experiment will disappear before accurate and systematic researches of this kind? I have occupied you very long; but there is one point connected with the superficial deposits to which before I conclude I must beg leave to draw your attention, in consequence of its bearings on the vexed question of the best distance and depth of drains. You will observe in the sections before you, by Sir R. Murchison and myself, as well as in some others which I formerly gave in your Journal, in a paper on the Geology of Norfolk, the manner in which the "warp" or angular drift which forms the surface soil, fills cavities in the subsoil on which it rests. Most of these cavities are the transverse sections of furrows which communicate with the deeper cavities, which are of the form of cylinders and inverted cones. These cavities are most conspicuous where the warp rests on chalk, but they are also found when it rests on sandstone or clay. Mr. Austen has lately stated in a paper read before the Geological Society that in the neighbourhood of Guildford a loamy soil, requiring to be drained, rests on clay, the surface of which is furrowed in this manner. He states also that the farmers have found that drains cut across these furrows lay dry a much larger area than when they are cut parallel with them. This is precisely what might have been expected. These furrows act as so many parallel natural drains, and the artificial drains crossing them become submains. Perhaps some of the contradictory statements which are made respecting the superior efficacy of deep and shallow drains might be reconciled by examining the relations of the drains to these furrows, and determining whether they were cut across them or parallel to them, and whether they extended into the impervious clay much below these natural subterranean channels, or just coincided with their average depth. That average depth I apprehend would be the most effective depth, whether more or less than three or four feet. I throw out these views as suggestive of inquiry. I may add that when acting in Ireland, in 1847, as Government Inspector of the Cavan Union under the Temporary Relief Act, I had few opportunities for geological research, I could not avoid observing, in traversing the county, fresh sections of the soil and subsoil laid open by the Relief Road cuttings of the Board of Works. Sections abounded exhibiting this irregular junction of the soil with a retentive subsoil; and I observed that the surface-water drained out along this irregular line of junction, whether it extended to the depth of four feet or was only two feet deep. I have since made similar observations in fresh railway cuttings in this country.

On the motion of Lord BERNERS, seconded by Sir John V. B. Johnston, Bart., M.P., the best thanks of the meeting were voted to Mr. Trimmer for his kind trouble in preparing, delivering, and illustrating by special diagrams, the interesting lecture they had then heard.

ON GRAZING.

BY A PRACTICAL FARMER.

"The profit of the earth is for all; the king himself is served by the field."—Eccles. v. 9.

That department of farm practice connected with the management of cattle, sheep, horses, &c., commonly called "live stock," during their consumption of the products of the farm, is denominated "grazing." It includes the management of the grass lands and other pasturage on the farm; and also fallow crops, so far as their consumption is concerned — this is winter grazing. We, however, in this article intend to confine ourselves to the stocking and depasturage of grass lands and other pasturage during the summer, *i. e.*, *summer grazing*.

Summer Grazing.—The Pastures.—Grass Lands.—Clover and other seeds ought invariably to be cleared of stock and "laid in" "at perfect rest" on or before the month of February, otherwise the trampling of the stock will seriously injure as well as retard the growth of the grasses and herbage, which at this period is just in that state most likely to receive injury from the treading of stock and the floods peculiar to the month. It is of essential importance to promote the early growth of the grasses; nothing should be allowed to check them, especially in their early stages. A vigorous start in the spring will generally secure a good pasture, which under ordinary care may be preserved throughout the summer. A good grazier will not stock his land till the pasturage is plentiful; otherwise, the stock having to pass to and fro so frequently in search of their daily food, tread down and destroy much young herbage, and the continued cropping of the young grass prevents it getting sufficient lead to insure a free and rapid growth. Secure a good pasture, and stock it lightly; the stock will then gently and pleasantly take their food, and lay themselves quietly down to rest; there is no unnecessary trampling of the grass—it has consequently a far better chance of improvement—the pasture soon abounds and becomes luxuriant—the grazier crowds in more stock—the pasture keeps its lead—the stock thrive—the grazier is contented. On the other hand, by stocking a bare pasture it is always kept bare—the stock, as we have said, are continually on foot, looking out for every blade of grass, apparently bent upon preventing their growth—they become restless and lose their condition, and nearly a whole summer is lost before they regain it. No plant can thrive under continued cropping of its leaves, much less so if it be those it first throws out; but let it gain a fair, if not a vigorous shoot, and it will bear much. Just so with field grasses; if they are continually cropped in their earliest stages, a most unsatisfactory summer pasture is certain to be the result; and, of course, the grazier's profit equally so. On clay lands, good spring pastures are indispensable before they are stocked, else the drought of summer and heat of the sun cause the herbage to burn up; whereas, a good pasture, carefully preserved, will last the whole summer: the land being covered with grass prevents by its shade the penetrating rays of the sun from absorbing too much moisture from the subsoil; a refreshing influence is kept up; the pasture retains its luxuriance, and the quality of the grass is very nutritious and fattening, quite equalling that on the better loams; and in moist seasons, accompanied by heat, they are better, being less laxative: fine loams grow too fast.

Cattle Grazing.—The Stocking of Pasture Lands.—This depends upon the quality of the land to be grazed. The *best lands* are commonly known as "bullock lands," and are those capable of fatting cattle from the richness of their grasses: these *best lands* are generally appropriated to the grazing of cattle. These lands are "laid in" in the early part of the winter. As soon as a good pasture is obtained, which will be about the close of April or the beginning of May, the bullocks are put thereon—the number depending upon the state of the pasture and geniality of the season. Fatting cattle must have good pasturage, and every care must be taken to keep the pasture in what is called a feeding state. As the grass increases more cattle may be put on it; and in luxuriant seasons horses may be put on, at the rate of about one to seven acres; but stocking with sheep conjointly, on the "best bullock lands," should be avoided: the sheep pick out much of the fine growing grasses, leaving of course the coarser for the cattle, but the horses more generally feed upon the short bare places, roadways, footways, and the like. They are not considered detrimental in a fatting pasture in the early part of the season, but should be removed soon after midsummer, or whenever the pasture begins to fall off. It has become a common practice in many districts to give fatting cattle an allowance of *four pounds* of linseed cake upon their pastures: it is either given in small tubs, or the dust or small pieces are sifted out, and the larger ones are thrown upon the ground, from which they are readily gathered, and without waste. This allowance of cake is, we think, highly advantageous, and in two ways—it will give that peculiar quality of hand to the animal which is so desirable, and the pasture upon the average will carry or fatten one head of cattle more upon every seven acres. The writer of this paper has for several years witnessed the good effects of this system upon two fields of ten acres each, and has practised it on others. These fields, prior to the introduction of the plan of giving cattle *cake upon grass*, were usually stocked with ten cattle (large oxen) in each field, or one per acre; now, each field will fatten with greater rapidity twelve, by having the above allowance of cake—thus making a

difference of one bullock to five acres. We believe this mode well worth adoption, and give it our most unqualified recommendation; it is a most effective way to improve grazing lands—the cattle thrive much faster, and are soon ready to give place to others.

In stocking these "best lands," much attention should be given to the proper choice of the stock to be depastured upon them. It is most advantageous to choose animals of good fattening quality, suited in size and weight according to the fertility of the land, and in good and thriving condition; indeed, almost fat—these will speedily be fit for the butcher. On being sold off, the land should be very heavily stocked with store cattle and store sheep, so as to feed the whole off in the shortest time possible, and then to be again "laid in" for a sufficient time to obtain pasturage preparatory to a renewed stocking. In this way, "two runs" of cattle may be fatted off every summer. Many graziers, however, prefer easing other pastures by taking off store or lean stock, and leaving them thereon for more rapid improvement. The droppings of the cattle ought to be repeatedly knocked and spread, and it is a good practice to mow some portion of the rough places every day in order to their being eaten more readily. This will keep the pasture more even, and materially improve the herbage of these places, and in what are called "grass" years (highly productive years) the cattle will be benefited by eating the partially dried herbage, for which they manifest frequently a decided preference. Those animals affected with purging will resort to it, and be benefited in this respect. If these rough places are left uneaten during a whole summer, they become a large tussac of grass, which nothing will eat afterwards; they destroy the finer herbage or grasses near them, and are finally rotted down in the ensuing winter. In stocking pastures on the lands not known as the "best lands," but still good enough to fatten cattle of medium size and quality, and which are known as second-rate "bullock lands," the same course may be advantageously pursued—the great difference will be in the choice of the animals. The best lands will fatten oxen of great weight; and their value is thus commonly estimated:—"That field will fatten an ox of a hundred stones weight—this one of seventy stones." If we come below seventy stones, it is then considered to be in the class of second-rate bullock lands. These lands are generally stocked with cattle of less weight, or, if stocked with large cattle, they ought to have an allowance of cake daily. The more common mode is to stock them with the smaller Scotch or Welsh cattle, small Devons, and the like; indeed, any breed not likely to exceed fifty or sixty imperial stones in weight. Heifers, drape cows, and two years old steers, thrive very fast on such lands; the former are much sought after by the grazier for this purpose. Lands of moderate fertility will advantageously graze stock, though put on in low condition, if it is allowed time to get a lead. The old adage says, "Twenty-four hours for the sheep, twelve days for the ox": this adage may be satisfactorily explained on studying the process of rumination—the herbage should be sufficiently long to be easily gathered by the ox—he will then soon lay down, and the process of rumination immediately proceeds." One of the modern improvements in summer grazing is the fattening of cattle in byres, hovels, or fold-yards. This introduction has materially lessened the annual value of the best summer-fed bullock lands, inasmuch as it provides a substitute. It is but a very few years since that the meat markets were supplied, during the months of June, July, and August, almost exclusively from these lands, and consequently the price of meat was proportionately higher in these months; this led to the adoption of the above mode of fattening cattle. It is now very generally practised by a great number of our best farmers, and with extraordinary benefit, not only derived from the fattening of the cattle, but in providing an immense store of valuable manure. This system is more beneficial to poor soils than others, because a crop of clover and other artificial grasses is thus made to produce as large a quantity of meat as the rich pasture lands, and also large supplies of manure to be applied in raising the corn crops. We say that it thus produces as large a quantity of meat as the richer soils—the assertion, we think, is correct. It is an indisputable fact that if any herb or root is left to grow undisturbed, to throw out its leaves and stalks to catch every favourable influence, atmospheric or otherwise, it will yield a larger plant, and a greater amount of herbage; just so with the artificial grasses—they must be left till they are ready for the scythe; they are then cut and carried into the fold-yard. Besides, in this partly matured state they are better and more substantial food than the young natural grasses fresh from the field, at a few hours' growth. We desire to guard ourselves and readers here: the quality and nutritive value of the grasses depend mainly upon the fertility of the soil upon which they are grown. We therefore mean that upon these poor soils the grasses requisite to fatten cattle must be of a highly nutritive quality, and as poor soils will not naturally produce such, they must be aided by artificial means, and which is now universally the case. The common mode of management is to stock the hovels, byres, or fold yards, with cattle in high condition, mow and give to them daily such quantity of food as they require, and in addition to supply them with meal or cake. We think that meal (by which we mean bean or pea meal), in this mode of fattening, is preferable; it can be administered economically in the crib, and is an excellent corrective against strong succulent food. About six pounds of meal given in chaff is a good allowance, and should be given in two feeds—morning and evening.

We cannot stay now to argue the point as to the universal adoption of this measure; but we will, by the way, just say that our opinion is decidedly in favour of it. We believe the "best lands," if so applied, would produce an astonishing quantity of most valuable herbage, and could be made, *under artificial grass culture*, to fatten a much larger amount of cattle than in the present system of ordinary grazing on natural grass pasture. Perhaps at some future time we may give our views upon this point.

Having hastily noticed some of the modes of stocking lands for the fattening of cattle, we must now say a word

or two relative to summer grazing *Store Stock*, and as our limit is nearly filled up, we must leave *Sheep Grazing* for another paper. By "store stock" we mean all those cattle, young and old, not intended for fattening at this season, *i. e.*, cows, breeding and suckling cows and heifers, young steers and heifers, calves, and working oxen. Milch cows certainly must have good pastures, but if put on good "bullock lands" they will incline to make themselves fat rather than yield much *creamy* milk. We prefer putting them thinly on the best sheep lands, taking care to keep a full pasture. Breeding and suckling cows and heifers should have the next advantage in the distribution of our pasturage. These we run thinly over our sheep-breeding pastures, and on these should be turned the working oxen, because coming hungry from their work, they lay greedily hold of such pasturage as the more lazy and fastidious animals may leave. The young steers and heifers we place next in the distribution of our pasturage, and run them on lands amongst young sheep, on the inferior pastures. We also make use of them, along with the sheep, in "mobbing" up our "bullock pastures," prior to relaying them in a second time; indeed, this kind of stock we place just where we have room, and change them about to ease or stay our pastures as we deem requisite. The calves we take great care of—they are put upon the "sweetest" and most healthy pasture we have, and are carefully watched and changed according to circumstances; even a day lost, through inattention while a calf is scouring, may cost its life. Cows are very subject to purgative affections: when this is the case, a change of pasture and dry food should immediately be resorted to. We shut them up a day or two to hay, and give but little water. We had two cows the other day violently affected, so much so as to fall off full three-fourths in their milk. They were shut up in a warm hovel two days, to hay or clover hay, and then turned out recovered. In every great change of weather, in heavy thunder storms or continued rains, much care is required in overlooking the whole herd: "The eye of the master grazeth the ox:" it is indeed upon his business-like judgment that success must depend; and in variable seasons it must and will be in constant exercise. We say the great characteristic in the mind of a farmer and grazier ought to be judgment; it is brought into requisition under every change and circumstance of his business, but more particularly so in the disposition and management of his live stock.

Sheep Grazing.—This department of grazing will include every other kind of pasturage on the farm not qualified to fatten cattle, or not usually so appropriated. The inferior grass lands, grass seeds, clovers, tares, trefoils, sainfoins, lucernes, &c., are all more or less consigned to the grazing of sheep. Those lands named as the second-rate "bullock lands," are exceedingly well adapted to the fattening of sheep, and they are for the most part applied to this purpose, being found to leave a larger margin of profit from grazing sheep than if grazed with cattle. The better class of these lands will fatten from four to seven sheep per acre, according to their breed, size, and age, and the peculiar tendency of the variety of sheep to lay on fat. We deprecate dogmatism upon any subject, and therefore beg our readers to view favourably the opinion we here advance (as it were in a parenthesis) upon the comparative merits of sheep—we think it correct. We do it with a view to their guidance, or at least to call to it their attention. We think these good *sheep lands* will fatten sheep of the various and most approved breeds in nearly the following proportions:—Heavy long-woolled sheep, five per acre; Lincolns and large Leicesters, eleven to two acres; small Leicesters, six per acre; Hampshire downs, thirteen to two acres; small downs, seven per acre; half-bred long wools and downs, six per acre; half-bred Leicesters and downs, thirteen to two acres. We also think that the lighter breeds of sheep possess still greater proportionate advantages in their propensity to fatten, and their quickness in fattening; but this is in some degree retarded by their more restless habits and greater tendency to rove or roam about the field, than in the larger and heavier breeds—they certainly are by no means so docile, nor do they rest so quietly or so long on their lair as the larger breeds. We offer no opinion further as to the relative merits of different breeds. Our own aim is to breed that kind of sheep from which we can obtain the most mutton and wool of the greatest money value, at the least expense, and in the shortest time. We think a large breed of sheep of quick growth best for our purpose, and have adopted it, but it is by no means applicable in all cases. However, without saying more upon this point, we do urge our readers to think much upon this subject, as upon the proper stocking of grass lands depends the profit of grazing. We think the grazier in proceeding to stock his lands ought to be guided in some measure upon the principle we have named—the relative value and adaptation of the breed of sheep and the land to be stocked, and the site or locality in which it is situate, also the design of such stocking, whether it be for folding or otherwise. These and various other considerations will of course have due weight with the grazier in determining his course of procedure.

The best Sheep Lands.—These lands should be treated in precisely the same manner recommended relative to "bullock lands"—the sheep being kept on turnips or similar food to as late a period in the spring as possible. They should then be stocked in accordance with the principle named above. As soon as the grass shows signs of taking a decided lead, young cattle should be put thereon, at the rate of one for every five acres; the cattle will graze upon the strongest growing places, and thus keep the pasture level and good. Care must be taken to remove them so soon as the pasture declines—for fatting sheep, as for fatting beasts, it must at any sacrifice be kept right, neither too full nor too short. In some seasons almost daily changes of the young stock may be found requisite to keep the pasture in its most feeding state. This is a point not to be neglected, if profitable grazing is to be insured. If the sheep are not made fat, the summer's grazing is nearly thrown away, and ultimately resort must be had to turnips or rape, to effect in winter what ought to have been done in summer.

The inferior Grass Lands.—In this class of grazing

lands we include down or hill pastures, as well as all other grass lands of inferior quality. These are best to be stocked with the leanest and most inferior sheep on the farm, or, if the grazier has to purchase sheep for them, he must take care not to obtain such as have been well fed, or have been grazed upon superior pasturage. The rule is progression—from worse to better, from better to better still. As the sheep improve in condition, they will not only be constitutionally strong enough for removal to a good and more nutritive pasture, but will, in fact, require it to promote their progress; if not, they will retrograde: and as their pasture falls off in the autumn, they should be supplied with cabbage or turnips to a moderate extent; or, failing these, corn or cake should be substituted. By due attention to supply the flock, when needed, with artificial aid of this kind, the inferior grass lands may be made to fatten vast numbers of sheep, and the extra food thus supplied will tend very much towards the permanent improvement of such lands. The most beneficial purpose, however, to which such lands can be applied, is in grazing breeding sheep, and young sheep, together with a proportionate number of young cattle. These will graze advantageously in conjunction, and the pasturage be kept in a far better feeding state, than if either were alone to be depastured upon it. The proportion we recommend in this kind of stocking is, one young steer or heifer to five young sheep or four breeding sheep (ewes and lambs); and if the season is a very abundant one, the proportion of young cattle may be still larger. The pasture ought on no account to be allowed to grow too fast, to get too rough or gross, so as to become unpalatable to the stock—a full complement of young cattle will always prevent this. They consume chiefly all the strongest grown or "benty" pasturage—the sheep the finer and shorter pasturage, and thus all is kept in a fruitful and nutritious state. We like to see pastures properly grazed, it argues well for the occupier—we at once pronounce him to be a man of judgment and sagacity; there is neither loss in stock nor waste in grass—all is freely and profitably consumed. But we cannot sufficiently deprecate the conduct of the careless occupier, who will allow the best of a summer's grass to grow, and remain unconsumed till the succeeding spring—it will destroy the finest pasture. We have at this precise time about forty cattle engaged in the consumption of this kind of pasturage, and on land of excellent quality too. It was allowed by the occupier to get a-head of his stock; and the season being a growing one, he could not from his own resources supply means to keep it down, nor get any aid from other quarters. This spring he has been glad to accept from the writer of this paper a number of young cattle, at a moderate price per head per week, to eat the grass of the last summer's growth; and from tussacs similar to the tufts in forest herbage, a very slight examination will prove the great injury done to the pasture—the fiorin, cocksfoot, smooth-stalked meadow grass, broom grass, and other strong growing grasses, having destroyed the finest herbage grasses, had rendered the field thin of plant, and the pasturage consequently comparatively unproductive. All pastures ought, at some period between Midsummer and Michaelmas, to be completely eaten up, so that no rough or old grasses are left for the winter. We think the best time for clearing up the pastures is during the month of harvest, beginning with some single field; this field or fields (as may be required) we would lay-in for a time, to take in that portion of the fatting stock we desire to push forward; the others, as they are fed off, we would lay-in for winter service, by turning the stock on to the stubbles, where for a time they will do well—breeding ewes, for instance, will do exceedingly well upon stubbles, and we think it is advantageous to them, inasmuch as at this period, when their lambs are taken from them, they require a change, to dry up their milk. The lambs upon being taken from their dams will require the best of the inferior grass pastures, and on which, and not on stronger, they should be put. As they grow and gain strength, they may be placed on weak-land eddishes or aftermaths; or what perhaps is still more preferable, if they are not too luxuriant, on the young clover eddishes, and from these to turnips, or other winter food. The ewes, after they have partially run over the stubble lands, should be returned to their summer pastures to gain condition and such forwardness as will prepare them earlier to receive the ram. These laid-in pastures are admirably adapted to benefit the breeding flock at this period, and ought invariably to be prepared for this purpose. No flockmaster will ever repent making due provision for his ewe flock at this time—it will insure him from barren ewes, and yield him a large fall of lambs. The young or yearling sheep may remain on the stubble lands at convenience, care being taken that they do not lose condition: from these they should go to their winter pastures, or other winter keeping, as the grazier may require for them.

Hill and Down Pastures.—In stocking hill or down pastures, we should choose from those varieties of sheep well calculated to travel—hill and vale graziers generally require their sheep for folding purposes on the arable lands; no heavy sheep will profitably perform this service. The active Southdown is, we think, just the very animal for this purpose—his light gallop, and great perseverance in search of food, make him invaluable for this department of grazing. The ewe flock, in particular, we prefer for this use. They like to travel over much ground, and to select their food as they best can. No lambs are ever found to thrive so well as those having a large breadth of surface to roam over, and no breed of sheep bear folding better.

Grass Seeds.—In grazing grass seeds we should adopt the same course as we would pursue in stocking and depasturing inferior grass lands, except putting on so much cattle. We think a somewhat heavier stocking with sheep would answer every purpose, and the whole of the herbage would be by them profitably and without waste consumed; but we see no objection to a fair proportion of cattle, if required by the economy of the farm.

Clovers.—These we think should be wholly grazed and consumed by sheep, and we prefer partial folding for this purpose. Clovers should be allowed to attain some strength of herbage before stocking: it is best for the plant—it is best for the stock. If the young

clover is kept constantly cropped, it will not carry much stock; but if permitted to get into bloom, it is almost impossible to over-stock it, and the stock will not only eat less, but thrive much faster. Our practice is, to divide our clover fields into compartments, and stock them successively, as our judgment dictates. We first mow for hay, and only consume the eddish or aftermath; but if the requirements of our farm were less, and we could afford to graze the whole crop, we should prefer adopting the same course. Clovers must be well grown before stocking, or much loss will ensue to both stock and crop.

Tares.—This is a far more succulent crop than the clover, and can never be grazed to its best advantage without folding; it ought on no account to be stocked till it has well grown, and then only with sheep. In a moist and fruitful season this crop will grow very rapidly, and will require much care in grazing it. We think a field may be well grazed in two parts: we allow the crop to get plant and a fair amount of herbage, and then heavily stock the one part whilst the other is growing, and as we finish off the one part change to the other, and so on through the summer, or till such time as we require the field for other purposes, or rather to sow with turnips. It is very desirable in grazing tares to supply the stock with dry food for them to take at pleasure: bean or pea haulm, or even wheat straw will be useful; but bean or pea meal, or similar food, is of great value.

Trefoils.—These we would graze and treat precisely as clovers; but as the lands are generally inferior upon which they are grown, we would recommend as much adventitious aids to be given as the grazier can afford.

Sainfoins and Lucernes.—These are not often grazed, but mown for hay. We would merely say, that if a grazier is, by force of circumstances, compelled to graze them, he must avoid close grazing.

Chicory, Burnet, &c.—These are in some separate localities adapted to grazing purposes. The former we are acquainted with, and know that it will produce a good crop for the scythe, but not for grazing. Burnet we also know is so unproductive as to be of little value to the grazier.

We have thus cursorily and hastily run through some of the departments of grazing. We feel that we have not done common justice to the subject—it is one that might in detail fill volumes. Our aim is to set our readers thinking, and we care not if it is even at our absurdities, if so it should strike them. We wish to advance every interest connected with agriculture, and if our very humble efforts are of the slightest avail in this respect, we shall be sincerely gratified.

PERUVIAN GUANO—ITS APPLICATION.

The discovery of deposits of manure from time to time is one of the favourable events of a period of agricultural struggle and development. The fossils of the green sand, the unapproachable phosphorite of Estremadura, are nothing, however, to the importance of the discovery of guano. When we speak of *discovery*, we do not refer to its use for so many centuries by the Peruvians on their native hills: this was an adoption: but we refer more particularly to the discovery of barren islands in rainless tracts, rich in deposits of the refuse of sea-fowl, deposited layer after layer in the lapse of ages. In our own island the same thing takes place. In the cliffs of Dover, of Flamboro', and other places, where large ledges of rock present themselves, deposits of the dung of sea-fowl continually occur; but, both in colour and quantity, as well as value, it is far inferior to the guano imported—even of the lowest quality. There may be many reasons for this. The birds are constantly disturbed by man's love of sport, or of destructiveness, if the term be preferred; and hence deposits are thinner—more scattered, and the accumulations altogether more exposed to the action of the atmosphere than when the quantities are larger and the strata thicker. But more: the rains of this country are constantly washing out the most valuable parts; and thus, if the deposits were much more extensive and important than they are, they would always bear a value low in comparison with guano deposited in rainless latitudes.

The island of Ichaboe was one of these important discoveries; and it was soon completely carried off by British enterprise. The cargoes of its guano—a little inferior to the Peruvian—were sold at from £6 10s. to £8 per ton, according to quantity and the markets at the period. Now, two other islands off the Peruvian coast, viz., Lobos de Tierra and Lobos Afuera, very rich in this deposit, have been brought into notice. These islands are uninhabited, are destitute even of the means of sustaining life, have neither *water* nor food upon them, and, consequently, are not likely to be inhabited, nor have they been owned. The Peruvian Government, it is true, have stated that they have exercised over them rights of ownership. Their fishermen have used them for a landing-place, and for mending or drying their nets. But this cannot be in any sense called ownership; and, if ever islands, hitherto neglected, useful neither for being inhabited nor for defence, belonged to the world and its adventurers, these are the places.

If the Peruvian fishermen made it useful, they may do so after its deposits are transported away; and, it no more constitutes property in the islands than if an English ship had called to take water at Ichaboe, it could have constituted that island the sole property of the British.

The Peruvian Government having the monopoly of all the trustworthy guano at present in use, put up the price at a very high figure. Now, though the opening of the Lobos Islands would give a license to adulterating and unprincipled traders to a very great extent, still it would reduce Peruvian guano probably to £5 or £6 per ton in this country.

Now it is almost impossible to calculate the extent of real and tangible relief this would be to the farmer. There are but a few farms where some of the land would not benefit from an application of guano—nay, more, there are few farms to which an *entire dressing* of guano would not be a real advantage. The whole grass land of the country, alluvial river-side land excepted, would do well with its assistance. On some soils it would make such a difference in the crop as to be a distinction between rent and no rent. At present, a moderate dressing costs, at the field, £1 per acre. Let it be reduced one-half, and it will cost but 10s. *Ten shillings per acre relief*, on all lands where guano is beneficial, is not a trifle!

And now a word on guano itself, and its application. It is not only the very material on which plants feed, but it is supplied in that form in which it is the most readily assimilable. It is equally good for wheat, barley, grass, and roots. It increases both straw and corn—both leaf and bulb—and often makes all the difference, in weedy land, between a smothering crop of cultivated plants, and a wild, choking cover of weeds. Excepting, perhaps, carbonized materials, of which most soils possess already sufficient, it contains the whole of the materials necessary for building up the structures of plants; and no drain is required on their vital energies to dissolve its affinities, so loosely does it hold the hidden wealth.

In applying guano, though experience has taught most persons, there are some who still require information. It will not be amiss, surely, to recapitulate the results of experience in its application.

Mix it always with the soil intimately. To drill it is both unnecessary and injudicious. It places too much together, and often, by its decomposition in the soil, destroys the seeds. It is far the best to sow it broadcast, and plough it in, or, at any rate, to mix it with the soil.

Sow it, where practicable, alone. It is only necessary to beat and sift it, and, when very dusty, to damp it a little; but it is often ruined and wasted by using it with *ashes* or other alkaline mixtures. Parties little know the injury they do by such heterogeneous doctoring.

If as a top-dressing, sow, if possible, before rain. This may be generally secured; and it is of far more importance to sow it when rain is pretty certain than to regard the *season*. If the signs should fail, and the rain should not descend as expected, the land should be harrowed, or rolled and bush-harrowed; but that will be great loss. It is safest to sow it during rain, to be certain.

Where it is undesirable to sow it broadcast, owing to the prevalence of weeds, and where drill husbandry is adopted, *sow it after the drill* by hand, broadcast. It will thus fall *over* the grain or seeds, and drop into the indentations the drill has made, and so encourage the seed more than the weeds between, and still not injure the former by contact.

We hope the Country will strongly memorialize the Government to secure the opening of the Lobos Islands; and no time should be lost.—Gardeners' and Farmers' Journal.

THE GUANO QUESTION.

(FROM THE MARK LANE EXPRESS.)

The guano question continues to attract great interest. An energetic correspondent, Mr. Benjamin Goulton, of Gedney Marsh, Lincolnshire, in a letter inserted elsewhere, asks, "Are there not ten thousand farmers to be found in England who are spirited enough to subscribe a sovereign each for the purpose of fitting out an expedition—say a couple of schooners—and sending them to the Lobos Islands for guano?" If ten thousand farmers could be found to thus co-operate, it would form a new era in the history of the British farmer. We should then have some hope, not of their settling the issue raised in respect to the sovereignty of the Lobos Islands by such an evidence of co-operation, but of their attaining that position of real independence as a class without which they never will acquire the power and influence amongst other classes in the state which the extent of their capital and the importance of their occupation should command. Another correspondent says—"So great is the value of guano, that I have no hesitation in saying that a reduction of 50 per cent., or £5 per ton, would be a greater advantage to the tillage farmer than a 5s. duty on wheat." And he exhorts the tenant farmers and farmers' clubs to bestir themselves in the matter. A movement is, as it seems, being made in Scotland; and in Devonshire petitions to the House of Commons

are now in course of signature. It will be seen by our parliamentary report that the subject was referred to by Lord Stanley in the House of Commons on Thursday last, when the noble lord stated that the Lobos Islands were formerly held to belong to the Spanish provinces, and that, on the separation of Peru from Spain, they passed to the Government of Peru without any specific mention; that the Government were not prepared to send ships of war to these islands, but they entertained a hope that some arrangement would be made to secure a supply of guano. Nevertheless, the question should be agitated, and, if the islands really belong to Peru, measures should be taken to induce the Peruvian Government to lower the price of guano. It is well known that from the reduction in the price of freights, a larger profit per ton is now made upon the article than formerly; and there is no doubt that a reduced price would lead to an increased consumption. The sulphur monopoly in Sicily was broken down by the perseverance of Lord Palmerston, when Foreign Secretary; and we have no doubt but that energetic remonstrances would have an effect upon the Government of Peru. If the opinion of our correspondent, "A Tenant Farmer," be correct, the Derby Government may avoid the difficulty and yet secure the advantages of a duty of five shillings upon foreign corn by procuring a reduction of the price of guano to five pounds per ton. The following remarks upon this subject appeared in the City Article of the *Times* this morning :—

"A supplemental statement on the Lobos Islands question was made on Friday night by Lord Stanley to the effect that the ship-of war sent to the islands by the British Admiral on the Pacific station had not been despatched direct, but was to call at them incidentally in connexion with a visit to Ecuador. His lordship also took the opportunity to add that the Admiral had expressed an opinion that the Lobos Islands are as much an integral part of the Peruvian Republic as the Scilly Islands are of Great Britain. With regard to the first of these statements, it is satisfactory that a visit to the islands is to be made by the same vessel that has been sent to Ecuador, because light will thus be thrown on the allegation, which has reached us only through the American newspapers, that the piratical expedition of General Flores had been permitted to make them points of rendezvous. Such an act would appear too flagrant to be credited except on unquestionable testimony; and it must therefore not be assumed to have taken place without further proof. If it should be shown that while Peru is professing to have exercised "acts of sovereignty" by keeping a few Indian catamarans from disturbing the birds, she has allowed a band of many hundred ruffians, organized for the purpose of attacking a neighbouring and friendly state, to make these islands, or either of them, a place of refuge, the fact will be important. An assertion of sovereignty which consists in saying that the good which the islands might do to the world shall be prevented, but that they may be used to inflict misery upon it by affording facilities to pillage and rapine, could, it may be presumed, hardly be considered valid. On this point, however, notwithstanding the partially known complicity of Peru in the Flores expedition, it would be useless to dwell without something beyond the loose allegations at present possessed. With regard to the opinion of the Admiral on the station, that the possession of the islands on the part of Peru has some analogy to our own possession of the Scilly Islands, it is difficult to comprehend on what it is founded. The assertion that the Lobos Islands are open to the world rests upon the fact of their being desolate, and of their never having been turned to any good account. In relation to the Scilly Islands, on the contrary, England has performed all those duties which can alone confer a right of possession. They are inhabited by fishermen and pilots, a lighthouse is maintained upon them, and they are regularly fortified; in addition to which, they are actually nearer to England than the Lobos Afuera is to Peru. It is not, therefore, by an off hand comparison of this sort that the question can be settled. As far as the national welfare is immediately concerned (if the statements about their amount of guano are not, as it is possible they may be, wholly erroneous), the affair involves considerations far more important than belonged to the Oregon question, and it is too much to expect that it is to be concluded by an irrelevant answer to a casual interrogatory in the House of Commons. The main point is whether any country can seal up a valuable product placed by Providence for the benefit of the world on an uninhabited island far distant from its own shores, and urge the fact of such sealing up as a proof of title. The natural impulse would be to regard such a step not only as no proof of title, but as even involving a forfeiture of title if one had previously existed, and in the case of the inhabitants of Japan, although at all events they use their country for their own comfort, it has actually come to be questioned whether they have a right, looking at the natural and inalienable duties of nations towards each other, to enforce that it shall be limited to that end. The next thing to be determined, supposing any claim to be allowed, is the degree of proximity that is sufficient to warrant such claim. If, contrary to the received opinion of jurists, the fact of neighbourhood within 40 miles is sufficient, is that to be the limit; and if not, shall it be 100 miles, 400, or any other fixed distance? The Lobos Afuera is not the only uninhabited island in the Pacific, and as anything now determined will constitute a precedent, it is of the highest moment, in view of the traffic which is destined speedily to be witnessed on that ocean, to arrive as soon as possible at some precise and intelligible conclusions.

PHOSPHATE OF LIME.—At a meeting of the Royal Dublin Society, held lately, Mr. Davey read a highly interesting paper on the subject of Native Phosphate of Lime, and its Application to Agriculture. He produced some specimens of the manure, which had been found in the state of New Jersey, and transmitted to him within the last month by Ralph Leigh Clare, Esq. A very extensive formation of the manure had been recently discovered there; and an analysis had been made of it by Messrs. Pilkington and Wilson, the eminent chemists at Liverpool, who had found it to contain from 70 to 90 per cent. of phosphoric acid. He also had made an analysis of it;

and the result was nearly the same. Its application to agriculture was quite new; but it was known to be highly beneficial as a manure, containing as it did large quantities of phosphoric acid in combination with lime. Mr. Clare was unable, as yet, to state what the exact cost of the manure would be; but, from the calculations which he had made, he believed it would be about £6 per ton—that was to say, 50s. per ton cheaper than Peruvian guano, and from 15s. to 30s. cheaper than the phosphates of lime at present manufactured from bones. That gentleman was exceedingly anxious that the manure should be tried by some of the extensive Irish agriculturists, and for that purpose he was willing to send over specimens free of expense (applause).

GROWTH OF THE WOOLLEN AND WORSTED MANUFACTURES.

It is now about 150 years since Gregory King estimating the annual productive power of the nation, put down the value of the wool used at two millions sterling per annum; and the value of the whole manufacture at eight millions sterling. There is no doubt that this estimate was a careful and sober one, as compared with the extravagant guesses of many of the political economists and arithmeticians of that period; still there are many data now existent, which render it exceedingly probable that the estimate was considerably too high. For the sake, however, of our present object, let it be assumed to be correct. At that period A D. 1700, the woollen and worsted manufactures were in a comparatively rude state; the use of steam was unknown, and, except for fulling, water power was not applied in any process. The art was indeed little removed from its primitive form, the manipulation of cloth was slow and expensive, and the eight millions which is named as the value of all the fabrics annually produced, did not probably represent one-fourth the quantity which would be represented by that sum now; the style and character of the later fabrics being, besides, far superior. In this state the art continued for the greater part of the last century, until by slow steps the steam engine of Watt and the carding and spinning machine of Arkwright and Hardgreaves, first applied with such marvellous results in the cotton manufacture, came to be applied to the manufacture of wool. Arthur Young, the celebrated writer on agriculture, states that in 1796 there were six or seven steam engines in Leeds, and adds, "the *machines which have done so much for the cotton trade are fast being introduced here.*" It was, in fact, the adoption, in the West Riding of York, of the steam engine, and the *adaptation* of the machines which had given so vast an impulse to the cotton trade, to the processes of the woollen manufacture, that led to the final transfer of the woollen and worsted trades from Essex, Suffolk, and Norfolk, to the former county. The growth of the manufacture was increased correspondingly with the improvement of its processes? and in 1800 Mr. Luccock, a well known and esteemed merchant of this town, wrote an elaborate treatise on wool, one great object of which was to establish a basis for calculating the value and importance of the woollen manufacture by a careful estimate of the quantity of wool produced in England and Wales. Subsequently—that is, in 1828, the late Mr. James Hubbard, of Leeds, in conjunction with the worthy candidate for this borough, Sir. George Goodman, on examination before the Lords' Committee on Wool, brought up the calculation to that year—assuming most of Mr. Luccock's data, as to the number of sheep per acre, &c., in the several counties to be correct. No estimates at all pretending to the same care and accuracy have appeared since these two, until Mr. Thomas Southey, one of the oldest and most respected wool brokers in the city of London, and who was already known to the public by several laborious and useful works on colonial wools and on the statistics of our Australian colonies, published a continuation of his works, bringing down all the authentic data, as to imports and exports, to the end of 1850. In this work, Mr. Southey gives a succinct but very clear detail of certain inquires which he had set on foot, in order to ascertain, as near as may be without actual enumeration, the number of sheep in the United Kingdom, and the average annual weight of shorn and skin wool, available for the purposes of the woollen and worsted trades. The result of these inquiries may be briefly stated. Mr. Southey concludes, on what he considers good and reliable evidence, that "we annually clip forty millions of sheep, whilst the fleeces of fifteen millions more, slaughtered, pass through the hands of the fellmongers, to the consumer." The basis of the manufacture, then would be about 275,000,000, lbs. of home grown wools, or, deducting 10,000,000 lbs. exported, 265,000,000 lbs., besides 70,000,000 lbs. of imported wools.

The four estimates refered to will be best understood in connection with what we have to add, by way of comment, in the following tabular form:—

		Great Britain and Ireland. Growth of Wool.	Population.	
Estimate.	A. D.	lbs.		
Gregory King's	1699	50,000,000	8,500,000	supposed.
Mr. Luccock's	1800	92,544,000	16,000,000	actual.
Messrs. Hubbard & Goodman's	1828	111,623,729	23,000,000	calculated.
Mr. Southey's	1850	275,000,000	30,000,000	actual.

It is obvious, at a glance, that the population and the growth of wool have not advanced at equal rates since 1800; the rate of increase in the former being about 85 per cent., and of the latter nearly 200 per cent., whilst during the same period the imports of wool have increased from 9,000,000 lbs. per annum to 72,000,000, lbs. or eight fold. The calculation of Mr. Southey more than doubles that of Mr. M'Culloch, writing in 1846, and therefore demands collateral proof of its correctness.

It may be observed, then, that Mr. M'Culloch made his calculation on proximate data; Mr. Southey after inquiries of practical and intelligent men—landowners, farmers, woolstaplers, and manufacturers. One general conclusion established by the answers of Mr. Southey's correspondents is this, that Mr. Luccock's estimate, in 1800, was below the mark. Now the calculations of Messrs. Hubbard and Goodman in 1828 assumed the correctness of Mr. Luccock's principal data, only allowing for increase of weight in the fleece and the number of sheep, by the more general cultivation of long wool and by better methods of stocking and farming. Mr. M'Culloch took the combined data of 1800 and 1828, and reasoned from them, without any separate and independent investigation of all the facts. Mr. Southey re-opened the inquiry, and, on what he holds to be sufficient evidence, gives a very different result. It would be out of place, in an article such as this, to give, in detail, the results of his inquiries; but we can add collateral proofs of the correctness of his conclusions.

It is now generally admitted that Mr. Luccock, who took extreme pains in his estimate, erred on the side of caution, and under-estimated the quantity of wool produced in 1800. But admitting his estimate to have been correct, other considerations will show that the quantity now produced must be far greater than Mr. M'Culloch's estimate. It is obvious that if at any particular moment of time the number of persons employed in the fabrication of a particular raw material, and the weight of raw material used up by them annually, are known quantities; then, if at another and subsequent moment of time, the number of persons so employed, and the increase of productive power, arising from improved machinery, are also known quantities, the weight of raw material used in the latter period is a demonstrable thing. It is not possible, however, to arrive at minute accuracy in either of the two great elements of the calculation—namely, the increase of the number of persons employed in the woollen trade, comparing 1850 with 1800, and the relative amount of productive power, man for man, at each period. But approximations are possible, and are most useful.

The increase of the entire population is ascertainable, and so is that of the principal county in which the woollen and worsted trades are carried on, viz., the West Riding of York. The increase of the population of Great Britain between 1801 and 1851, was 93 per cent.; and the increase in the West Riding of York, 132 per cent. Supposing then, that the manufactures of wool are relatively to population as much in demand now as in 1801, (and, considering the enormous production of worsteds since 1831, there can be no doubt on that point), it is clear that the weight of raw material required would be doubled, even if no advance in skill had been made.

But the fact of a mighty increase in the productive power of all classes of producers since 1801 is one of the great facts of the age. Within the last 70 years, hand scribbling and carding have given place to the huge scribbler and carder driven by steam power. The one-thread wheel has been displaced by the jenny and the mule; the dubbing board and the shearboard have been superseded by the gig, the Lewis, and the perpetual; and although in the woollen trade the hand loom is still retained almost exclusively, the worsted trade numbers its 32,517 power looms, a number probably equal to that of all the power-looms used in all trades in 1825. It is, indeed, true that improvements in machinery have led to greater elaboration in the textures which issue from our looms, and thus far have counteracted the tendency to increase the demand for raw material. It is also true that the introduction of machinery has created vast trades, subsidiary to, and dependent on the textile manufactures, such as engine and machine makers, manufacturers of spindles and power looms; and that in estimating the increase of productive power the persons employed in these trades must be included along with the workmen directly engaged in any particular manufacture, in order to a just comparison with 1800.

Admitting these things, it is palpably within the mark, that the productive power (man for man) is now double that of 1800. Combining, then, the two elements of a double population, and a double productive power, and assuming woollen and worsted goods to be relatively to population as much in demand as in 1801, it is obvious that the quantity of wool required in 1850 will be four-fold that used in 1800. The quantity then used, including imported wools, was in round numbers 101,000,000 lbs., and therefore the manufacturer will now require 404,000,000 lbs. Mr. Southey's calculation is 335,000,000 lbs. only; and is, for the reason stated, considerably under the probable consumption of home, colonial, and foreign wools, in this country.

It may be argued that although the population

of Great Britain has increased 98 per cent. since 1800, and that of the West Riding of York 132 per cent., it may still be true that the increase in the number of persons engaged in the woollen and worsted trades is not commensurate. We doubt that exceedingly. There are, however, no positive data.

It has already been stated that Leeds had six or seven steam engines in 1796, when probably Bradford might have had one or two, and the West Riding some two or three score. No statistics of the number of factories exist prior to 1834, and since that year two further enumerations have been made, namely, in 1839 and 1850. They show the following figures:—

WOOLLEN AND WORSTED MILLS, STEAM POWER, &c.

UNITED KINGDOM.

	1834.	Mills. 1839.	1850.	Horse Power. 1839.	1850.
Woollen,	1322	1322	1497	20627	22144
Worsted.		416	501	7176	11515

WEST RIDING OF YORK.

		Mills.			Horse Power.	
	1834.	1839.	1850.	1839.	1850.
Woollen trade	601	613	880	10241	12153
Worsted trade		348	418	5791	9389

NUMBER OF PERSONS EMPLOYED.

UNITED KINGDOM.

	1834.	1839.	1850.
Woollen	71274	54018	74443
Worsted		31628	79737

WEST RIDING OF YORK.

	1834.	1839.	1850.
Woollen	40890	27548	40611
Worsted		26603	71334

INCREASE.

ALL ENGLAND.

	Horse Power. 1839 to 1850.		Persons Employed. 1834 to 1850.	1839 to 1850.
Woollen trade...	7½	per cent.	116 per cent.	37 per cent.
Worsted trade...	60	„		152 „

WEST RIDING OF YORK.

Woollen trade...	19	per cent.	174 per cent.	48 per cent.
Worsted trade...	110	„		169 „

Admitting that the steam factories erected since 1800 have to a considerable extent simply replaced the primitive weaving sheds and cropping shops, in which the processes of the woollen manufacture were at that time carried on, the above data, showing so prodigious an augmentation in the number of persons employed, in the short space of 17 years, combined with the previous rapid growth of mills and population in the valleys of the Aire and Calder, and around the centres of Bradford and Huddersfield, leave no room for doubt, that notwithstanding the transference of the woollen and worsted trades from other counties to the West Riding, and the comparatively stationary condition of those trades for some years in Wiltshire, Gloucestershire, and Somersetshire, there has not been less than a four-fold increase in the total products betwixt 1800 and 1850.

In a subsequent article, we shall develope certain interesting and important conclusions which this fact of progress establishes, particularly as respects the national position and value of the manufacture of wool, the interest of agriculture and of our Australian Colonies, the employment of labour, and the great question of free trade.

No. II.

In our last week's paper, data were given which fully warrant the conclusion that the consumption of wool in the various departments of its manufacture is not less than 325,000,000 lbs., that is, 260,000,000 lbs. of British wool, and 65,000,000 lbs. of foreign and colonial wool; allowing for the quantity of each kind exported. It must be noted that Alpaca and Angora wool are included in the estimate of the weight of the foreign wool used. Proximately, then, a calculation may be made of the value of the manufacture, though, in the existing state of national statistics, such calculation is necessarily based on probabilities, or, at best, indirect evidence. The value of the principal element, the raw material, is not difficult to estimate; but there is considerable difficulty in determining what additional value is put on the raw material in the woollen and the worsted trades respectively, and still greater difficulty in determining the respective quantities of wool used in those trades. The factory returns alone do not furnish a sufficient basis for determining either the relative weights of wool used, or the relative value of these two great branches of the manufacture. The Occupations Abstract of the census of 1841 is of little use in determining this point; and to render the calculation more difficult and complex, it is necessary to number the artizans employed in fabricating the steam engines, spindles, looms, &c., &c., used in the manufacture, whose labour, *indirectly*, forms an integral part of the value of a yard of woollen cloth, or stuff, or carpeting respectively. On *actual* data, however, extending over a period of several years, the following have been ascertained to be the proportions of the several items which constitute a yard of woollen cloth of the value of 9s., wholesale price. Dividing the whole into 100 parts, the proportions would be—

Wool	47
Other raw material—say oil, soap, dye wares, &c.	10
Wages, direct	24
Wages, indirect; rent, wear and tear, and interest of capital	19
	100

It may not, perhaps, be wide of the truth to infer that a yard of woollen cloth, when it leaves the wholesale dealer in the finished state, is just double the value of the wool of which it is composed. Relative to worsted fabrics, we are not in possession

of such definite data, and from the minute subdivision of labour in that manufacture, a calculation similar to the above is not easily to be obtained. There are few worsted mills, if any, in which all the processes are carried on, from the combing to the dyeing and pressing, and it would only be practicable, by an extended and complex induction, to frame a scale of proportions.

Amongst practical and experienced men, too, the differences of opinion are so great, that an average result, on which any strong reliance can be placed, is almost unattainable. It will not, however, be an over-calculation to assume that a pound of wool made into a stuff fabric doubles in value. One estimate which we have had makes it only half that, but there are *facts* which show that the estimate *cannot* be correct. Taking the number of spindles employed in the woollen and the worsted manufactures respectively, it is reasonable to conclude that three-fifths of all the wool consumed in Great Britain is made into woollen cloths, carpets, &c., and two-fifths into stuffs. Now, if the calculation be correct, that the value of a pound of wool is augmented only fifty per cent. by the processes of the worsted manufacture, it would follow that the entire value of that trade is not more than ten millions sterling. But the stuff fabrics and worsted yarns exported amount to eight millions sterling; and it is out of the question that the stuffs consumed at home are not more than two millions sterling in value. Either, then, the value added to a pound of wool wrought into stuff is very much more than fifty per cent. on the cost of that pound, *or* the quantity of wool so wrought up forms more than two-fifths of the whole quantity annually consumed, *or* the latter is much understated. On a careful consideration of conflicting data, the conclusion which appears to reconcile and harmonise all the facts is, that the value of the worsted manufacture is *more* than double the value of the wool used. If so, without settling, or attempting to settle the proportions of woollen and worsted fabrics, the following figures will give the total value of the manufactures of wool:—

	Raw Materials.	
lbs.		£.
260,000,000	of British wool, at 11d. per lb.	11,958,333
65,000,000	of foreign and colonial wool, Alpaca and Angora, at 1s. 8d. per lb.	5,416,666
		17,374,999
	Value added in manufacturing—say, other raw material, wages, wear and tear of machinery, rent, profit of capital, &c.	17,374,999
		£34,749,998

Gregory King, in 1699, estimated the value of the woollen manufactures at eight millions sterling, or *four-fold* the value of the raw material. In 1844, Mr. M'Culloch estimated it at twenty-four millions sterling. In round numbers, then, the value has increased three-fold betwixt 1699 and 1844, and nearly four-fold betwixt 1699 and 1852; population in the mean time, having increased in a nearly corresponding ratio. But if quantity, not value, be regarded, the proportions are vastly discrepant. In 1699, the weight of wool manufactured was estimated at 50,000,000 lbs.; in 1852, the estimate is 325,000,000 lbs., nearly seven-fold! Relatively to population, the quantity of wool manufactured in 1852, compared with 1699, is as 7 to 4; and if regard be had to the character of the fabrics now produced, of which a large proportion are adapted for female wear, there can be little doubt that the mass of commodities produced, estimated in yards, is augmented in a degree greatly exceeding the simple increase in the quantity of wool used, or of the money value, whilst in design, finish, colour and texture, the later fabrics are incomparably superior.

Relatively to the other great staple manufacture of this country, the total value of the woollen manufacture stands as 3½ to 5; a very eminent authority in Manchester estimating the cotton manufactures at fifty millions sterling per annum. Relatively, however, to the value of each manufacture, so far as that value arises from the use of British labour and capital, the difference is not so great as these figures indicate. The cotton manufacture includes twenty millions sterling as the value of the raw material, and thirty millions as the wages and profits of British industry, applied in its fabrication. The woollen manufacture includes £17,374,999—being the wages and profits of British manufacturing industry, and £11,958,333—being rent, farmers' profit, and labourers' wages, in the production of wool. Considering these simply as British products, the value of the two staple manufactures will stand thus:—

The cotton manufactures	£30,000,000
The woollen and worsted do. ..	29,332,332

The difference is far less in favour of the cotton trade than has usually been supposed. The error of calculation has arisen, in part, from the fact that the woollen manufacture, in its various branches of woollens (properly so called), stuffs, hosiery, carpets, flannels, and shoddies, is indigenous to almost every county of the British Isles, whilst the cotton manufacture is chiefly located in Lancashire, Renfrewshire, and Lanarkshire; and in part, too, from the under estimate of the production of English wool, by all statists, until the correction by Mr. Southey.

Assuming the correctness of the preceding figures, it will follow that the woollen manufacture is of the annual value of about twenty millions sterling, and the worsted of fifteen millions. As export trades, however, these figures give a very imperfect idea of their relative importance. On the average of 1820 and 1824, the value of woollens and worsted goods exported was as follows :—

Woollens	£4,682,788
Worsteds	1,560,929
Total	6,243,717

In the last year (1851) the values were respectively :—

Woollens	£1,920,000
Worsteds	6,664,859
Total	8,584,859

There was also an import of yarn (worsted) in 1851, amounting to £1,451,093, making an aggregate of worsted exports of upwards of £8,100,000, against less than £2,000,000 exports of woollens. The causes of this mighty change are somewhat complicated, but it does not admit of doubt that the facilities with which the processes of worsted *drawing, spinning, and weaving, admit* of the application of machinery, combined with the enterprise of the manufacturers of Bradford, Keighley, and other towns in the worsted district, in devising new styles, have principally contributed to this result. From certain difficulties which attach to the peculiarity of the *woollen thread*, it has not been found practicable to apply the mule and the power-loom, to any great extent, in the manufacture of cloths. The manufacture remains, therefore, very much in a primitive form, and the finished article has not been reduced in cost, in a degree at all corresponding to the reduction in the cost of worsted and stuff goods. A curious illustration of this is afforded by Smith, in his "Memoir of Wool," who states that in 1738 a pack of wool made into *cloth*, would employ 58 persons a week, earning £19 8s., or 6s. 8d. each; whilst a pack of wool made into *stuff* would employ 158 persons, earning £33 12s., or 4s. 3d. each per week. Taking the pack of wool at £9 in that year, the value would be enhanced upwards of 200 per cent. if made into woollen cloths, and 370 per cent. if made into stuffs. The higher cost in the case of stuffs would doubtless arise principally from the cost of combing and spinning, at that time done on the one-thread wheel. The smaller addition now made to the value of a pack of wool, converted into woollen cloths or worsted stuffs respectively, measures the saving of labour by the introduction of machinery; whilst the actual and large increase of money wages per head paid to the fewer persons who can now work up a pack of wool, combined with the vast augmentation of the quantity fabricated, and of the population employed on it, unanswerably demonstrates the unsoundness of the theory which ascribes to machinery the diminution of wages and population alike. As an illustration of the immensely increased production of worsted fabrics, it may be stated that, in 1820, the exports of the class described as "Woollens mixed with cotton," was 407,716 yards, and in 1849 it was 42,115,401 yards; and that the export of *Stuff Pieces*, properly so called, was 828,901 in 1820, and 2,003,595 in 1849; and it must be especially noted that in the latter year the texture, quality, and style of the fabrics exported were immeasurably superior, too, as compared with 1820, and that as respects stuff goods, the substitution of the broad piece for the old three quarters, makes the 2,000,000 pieces exported in 1849 equivalent to an export of 4,000,000 pieces, as compared with 1820.

We must reserve for another article the promised notice of the effect on the employment of labour, and on the interests of agriculture, and on the Australian Colonies, consequent on the enlargement of the woollen manufacture, concluding the present with facts of great interest as to the present supply of wool.

From the time of Edward the Third to the year 1824, the cry of the woollen and worsted manufacturers of England was—"No Export of Wool"—believing that British wool was essential to the proper manufacturing of cloth, and that if foreign nations were debarred from its use, England would make woollens for the world. *Now*, the cry is—where shall we get wool enough for our use?—and as it is useless to ask other nations to send us wool while prohibiting the export of our own, the trade is now free, and wool goes in and out, according to the fluctuations of price, and the necessities of the manufacturers.

In 1800, the whole import of foreign wool was 8,609,793 lbs., of which nearly 8,000,000 lbs. were from Spain and Portugal. In the last year the import was 81,063,679 lbs., of which 51,000,000 lbs. were colonial wools; and the cry is still, like that of the leech, give! give! we want more! Large as is the increase in the growth of English wool, it does not meet our wants; the world must be ransacked, and every nook and corner explored to supply our need. It is a curious and instructive fact, that in 1800 the only foreign nations which sent us wool, in addition to Spain and Portugal, were Norway, Prussia, Germany, Holland, Italy, Turkey, and the United States; and from these the aggregate import was only about 500,000 lbs. less than is now imported from semi-barbarous Egypt; and that almost every state in the four quarters of the world now sends its quota to feed our spindles and looms.

Some of the facts of our present supply are remarkable. After the peace of 1815 the greater part of the supply was from the continent of Europe; and in one year, 1825, the import of German wools alone was near 29,000,000 lbs. Since that year the entire import of all foreign wool has sunk to that figure, and as before stated, the import of colonial wool has risen to 51,000,000 lbs.

As in the cotton manufacture, so in the woollen, raw material is the desideratum, and the world is taxed to supply it. The most remarkable fact, as to that supply, is furnished in the history of the Australian colonies. In 1810 the number of sheep in New South Wales, then the only settlement in New Holland, was 25,888; in 1849, the number of sheep in that settlement, and in the other settlements of South and West Australia, and Van Diemen's Land, was upwards of 15,000,000. In 1816 the entire import of Australian wools was 13,611 lbs., and in 1849 36,000,000 lbs. The increase in the supply from other parts of the world is only less remarkable, as the following statement will show:—

		lbs.		lbs.
South Africa ..	1816	9,623 ..	1849	5,377,495
India.....	1821	18,175 ..	1849	4,182,853
South America..	1820	88,407 ..	1849	6,014,425

Large as is the supply the demand is commensurate; *nay more*, the demand under a continuance of peace will be a rapidly augmenting quantity. Great as were the improvements in manufacturing art betwixt 1760 and 1800, their progress since 1820 has been even more remarkable. The steam engine, the mule, the carding and roving machines, and more recently the application of machine power to the process of combing, by Donisthorpe's patent, have wrought an entire revolution in the manufacturing arts, and it is only possible to limit the power of production by exhausting the power of the soil on the one hand, or the desires of man on the other.

No. III.

The fact of an immense increase in these trades being proved (as we consider may now be assumed) in our two preceding articles on this subject, it only remains now to notice—1. The efficient cause of that increase; 2. The effects it has produced on several important interests; and 3. Its bearing on the great question of free trade.

The one simple efficient cause of the increase in the manufactures of wool, as in all other textile manufactures, is to be looked for in the progress of science, as applied to the manufacturing arts. In the progress of the population, by the force of a natural law, growth in all branches of production was to be expected, except some impediment stood in the way, such as a resort to inferior soils compelling the application of a larger proportionate share of the labour of the community to procure its food; less remaining thereby available for the production of other things. It is, in fact, to an increase in production, not *pro rata to population*, but in a ratio *relatively greater than that of the population*, that we shall refer throughout this article; for we have shown that, *man for man*, the increase in the woollen and worsted trades, within the last 150 years, is moderately estimated at nearly double.

Why then are all manufactured goods more abundant relatively to the population now, than in 1700? The answer lies in a nutshell, viz., because every man now works with better tools, and more manual skill and dexterity, than in 1700; because all modes of transit have been improved, thus facilitating the transmission of goods, either raw material or finished, and thereby reducing one great element of the price—the cost of carriage; and because, further, the facility of transport has rendered exchange practicable and easy where formerly it was impossible, thus actually creating new industries; whilst it has much diminished the outlay in *dead stock*, necessary to carry on a trade, which practically is equivalent to a reduction in the price of all articles of general consumption. And to whom, or to what do we owe the more perfect appliances of the present day. Unquestionably and primarily to such men as Watt and Arkwright, Crompton and Hargreaves, Kay and Cartwright, in the department of mere mechanical appliances—the steam-engine, the carder, the mule, and the power-loom, being the great types of this department; and subsequently, to our Brindleys and Stephensons, our Sharps and Fairbairns, in the the department of transit—the canal, the railroad, and its great king, the locomotive engine, the steamboat, the railway tunnel, and the viaduct, being its chief types. Nor should injustice be done to a thousand other names in every department of productive art. It would fill a volume to enumerate the men who have applied some known principle in a novel and extraordinary manner, or combined several in previously unthought of modes of action, or made actual discoveries of new forces or applications of forces, such as galvanism in the blasting of rocks, and electricity in the communication of thought.

Nor would volumes suffice to describe the million inventions, in themselves wonders, if not eclipsed by still greater achievements, but of which it may still be said that not one but has had its influence in the general progress, and of not a few that they were the indispensable and connecting links in the mighty evolutions of some great principle in mechanical and chemical science; for it must not be forgotten, that it is not one great leap in discovery

which has made productive art what it is, but an infinite number of toilsome efforts by millions of thinking and patient men.

What, then, has progress in manufacturing art, looking only to the woollen and worsted trades, done for the *land* of Great Britain? It has (speaking generally) doubled its production of wool in proportion to population; and probably quadrupled the proportion of sheep, because the sheep of 1850 is a very different animal in weight and value to the sheep of 1700. Looking to rent alone, Gregory King estimated the rental of England in that year at 12 millions, and in 1850 it was 48 millions, notwithstanding that enormous masses of the land of 1700 had passed, betwixt that year and 1850, into other categories—railways, mines, quarries, towns, mills, &c., to meet the demands of the manufacturing classes—a transference which has put untold millions of the fee simple of 1700 into the pockets of the landowners.

It is not contended that the mere increase of the woollen and worsted manufactures has done all this; but it is indubitable that the increase in the textile manufactures, of which these are more than a fourth, has done it, and just because of that progress of the manufacturing interest which for the last thirty or forty years has been regarded with so much jealousy by the territorial interest; and to which, it is presumed, reference was recently made by the noble earl, the premier of this country, when he stated his intention not to carry out the parliamentary reform measure of the ex-minister, because it would disturb the balance of the constitution—we presume the relative power of the one interest, and of the other, in the House of Commons. He is *content* to take all the disturbance of that balance which flows from manufactures in the shape of increased rental—*non-content* to concede that equalisation of political power, which altered social relationships demand.

What the progress of these trades has done for the operative class is soon told. Cheaper clothing has enabled them to bear up against dear food, and *how dear* food was from 1790 to 1830 especially, our readers need not be told. It has immensely augmented the demand for labour, as it has opened up new channels of foreign trade; and thus obviated what otherwise would have been inevitable, the terrible evils of a growing population struggling with a limited surface of soil—evils of which the most prominent are moral degradation, pauperism, and crime. It has demonstrated, by the *fact* of an unprecedented increase of population, concentrated just where machinery has been most largely used and most rapidly improved, that machinery does not supersede labour, but simply adds to its efficiency; in one word, that it is not the perfection of the instrument with which a man works that determines the extent of his employment, but the limitedness or *un*limitedness of the field to which he has access for food. In the judgment of thinking men, this question was settled half a century ago; but the last four years have demonstrated it to the parties most immediately concerned, the operatives, by the force, not of reasoning, but of plain facts—the facts being, that at a moment when mechanical and chemical science had made each man, woman, and child, simply considered as producers, four, eight, or ten fold more efficient than 150 years ago, and with a population the most dense and concentrated, all efficient labour is in greater demand, wages are higher in money amount, and still more so as measured in commodities, than at any former period, and more especially at that period when the instruments with which man wrought retained the stamp of the earliest era of manufacturing art. Within 150 years, implements which retained the closest resemblance to those used by the earliest nations of the world, the people of Central and Western Asia, have been displaced by the prodigious power of steam, the mule spindle, and the power-loom; and yet population, during the displacement, has gone on with a geometric ratio of increase, and there appears no limit to the progress, either of population or of manufacturing art, but the limit of the earth's surface to supply food.

The bearing of the great increase of the wool manufactures on the past progress and future prospects of Australia is most important. It is little more than 60 years since New South Wales was founded as a colony, by 1,030 persons, of whom 800 were convicts. South Australia was founded in 1835; Western Australia in 1829; and Van Diemen's Land came into notice as a colony about 1817. The joint population of these four colonies in 1839 was 170,676, in 1848 it was 333,764, and at this moment it is more than probable that it exceeds 400,000. In 1816 the exports of wool to Great Britain amounted to 13,611 lbs.; in 1839 they amounted to 35,774,671 lbs., as under:—

New South Wales.....	26,966,219 lbs.
South Australia.....	3,665,758 ,,
Western Australia.....	143,651 ,,
Van Diemen's Land	4,999,043 ,,

In 1810, New South Wales had 25,888 sheep; in 1849 the number in all Australia was 15,087,903, distributed as under:—

New South Wales.....	12,102,540 lbs.
South Australia.....	1,088,400 ,,
Western Australia.....	144,000 ,,
Van Diemen's Land	1,752,963 ,,

Supposing one shepherd sufficient for each 500 sheep (an extreme limit), 30,000 male adults will be employed in tending the flocks. How many

more persons are indirectly employed in the annual shearing of the wool, its transit to the coast, the packing, &c., cannot be ascertained; but there can be little doubt that at least one-fourth of the general population derive employment and subsistence from the breeding of sheep, which in Australia is a secondary consideration, the produce of the fleece being the ultimate object of by far the larger portion of the sheep breeding. The rapidity of increase in the export of wool will be shown by the following short statement:—

1816	13,611 lbs.
1821	175,433 ,,
1831	2,541,205 ,,
1841	12,399,090 ,,
1849	35,774,671 ,,

It is palpable that, as an object of local enterprise and profit, the growth of wool is absorbing more and more the attention of the colonist. The inducements still further to extend the culture are not likely to diminish so far as the demand for this country is concerned. As in the cotton, so in the woollen and worsted trades, there is a growing anxiety as to the future supply of raw material—all the tendencies of manufacturing art being still, as from 1760 to the present day, to intensify the demand for raw material. True, the demand is somewhat checked by the tendency to elaborate the make, pattern, and colour, proportionately as the mechanical processes of roving, spinning, and weaving are rendered more rapid in evolution and less costly; but these again are undergoing the same process of improvement, and it cannot be doubted that the call for wool for the next ten years will exceed by very much the call of the last twenty or thirty years, relatively to the population of the respective periods. Nor must it be forgotten, that whilst the whole import of *foreign* wools (as distinguished from colonial) was less in 1849 than in 1819, the re-export of wool to the continent of Europe (chiefly colonial) was upwards of twelve million lbs.; furnishing decisive proof of an augmentation in the demand for wool on the continent of Europe, as well as in Great Britain; the proof of a large increase in the production of continental wools, especially in the states of the Zollverein, being ample and authentic.

How far the Australian gold fever may divert labour in the Australian colonies, from the pasturage of sheep to gold digging, remains to be seen. But it may safely be said that, however mischievous the diversion of labour may be for a time, it cannot be a permanent mischief, nor, in the long run, prevent the increasing and urgent wants of English spinners from being supplied by Australian flock-masters. Either the gold fields of Australia and California will continue to yield as abundantly as now, or they will not. In either case, it needs no deep sagacity to perceive that the period will soon come at which gold will bear a value just proportioned to the cost of production, and will draw to it just so much capital and labour as will suffice to supply the demand. It is obviously *impossible* that an article of production, in no possible form available for man's subsistence or clothing, which never can form the staple raw material even of the tools he works with, and the use of which, hitherto, has mainly been as a medium of exchange, *simply because of its scarcity* and high value (a use, on one supposition, it must soon cease to have), or, as the material of works of mere art and luxury, *can* continue long to draw to it such a number of persons as will interfere with the production of the great necessaries of life, or those articles of clothing, taste, and comfort, which now employ 999 out of every thousand of those who work!

It only remains to notice the relation which the growth of the woollen and worsted manufactures has to *Free trade*. Retrospectively a most important and significant one. Both trades have been the *pets* of Protection. Agriculture never was protected as was the woollen trade, when it was felony to export a pound of wool, or even of fullers' earth, for fear the monopoly of supplying the world with cloths by *English clothiers* should be destroyed. Up to 1824, the prohibition continued, and was only removed after a strong and somewhat vehement opposition on the part of the worsted spinners and manufacturers. It was prophesied that if English wool was *exported*, the sun of Great Britain's glory would soon set, and Bradford streets, like those of Harwich now, grow grass for sheep to eat! Well, we know the result. The worsted district of the West Riding of York is precisely that spot in the whole empire in which, since 1824 (the date of the repeal *against exportation*) the progress of population, mills, machinery, and wealth has been the most rapid and wonderful. So then the *free export* of wool has not ruined the manufacturers, whilst it has opened up an export trade of upwards of eleven million pounds of English wool to the home agriculturists, besides several millions of pounds in the form of yarn.

Prior, however, to the Free Trade step, *in favour of themselves*, which a landlord majority secured in Parliament, by opening up the foreign market for their wool, they had succeeded, in virtue of the same majority, in imposing a duty of sixpence in the pound on foreign wool *imported*. They imitated the conduct of the manufacturers of bye-gone times—that is, they secured a right to export what they produced, and the right to restrict the import of similar commodities, the product of foreign nations. We know the results here again. English wool

fell in price during the operation of the protective duty in its favour; the woollen and worsted trades languished, for the simple reason that the duty was a premium to foreign manufacturers in the market of the world, and a check to production at home; and in 1823, after a lengthened inquiry and debate by the Commons, the obnoxious duty was reduced to one penny per lb., which was ultimately abolished on the motion of Sir Charles Wood. Well, the result has been that from that year the accelerated growth of both the woollen and worsted trades has gone forwards, with many halts, however, caused by the dead weight of a corn law coming down in years of deficient harvest on the springs of industry; the demand for English wool, and English mutton too, has gone on increasing; and, the two steps in favour of free trade already named, having been succeeded by the great measure of free trade in food, the progress of both trades has been without any parallel in the past, and it is needless to say, so far as wool and mutton go, without any parallel as respects the advantage of the agriculturists in their supply.

We must not trespass beyond a few sentences, as to the *prospective* bearing of our subject on *free trade*.

Betwixt one-fourth and one-fifth of the supply of the raw material of the woollen and worsted manufactures is of *foreign* or *colonial* growth. At the past rate of increase, in a quarter of a century more at the furthest, one half the supply will be foreign and colonial. Suppose a war with some powerful continental nation, or with a combination of them, and this supply must be to a great extent stopped; and the demand for goods being checked by the double action of interrupted exchange and a higher price consequent on the risks of sea transit, the demand for employment will be immensely disturbed, and the consequences on our vast and concentrated town population may be imagined, but cannot be described.

A few months of this condition of affairs (a few years would induce a perfect chaos of society) would convince all men, in England at least, that war and free trade are incompatible things. Free trade supposes an identity of interest betwixt nations, and a commingling, as of one family; and cannot co-exist with the idea or practice of war, which supposes antagonistic interests, *somewhere*, as betwixt one nation or family, and all the rest. Deliberately, then, is the conclusion formed, that this country, in enacting free trade has committed itself to a state which it can only maintain, ultimately, by securing the recognition of it by other nations; and the first step now to effect that is to show by her attitude on all international questions, that she has only just, wise, and world-wide ends of benevolence in view, and that she seeks no other means to effect them than the peaceable one of free unfettered commerce with the world's families.—Leeds Mercury.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

[FROM THE TIMES' COMMISSIONER.]

NORTHAMPTON, February, 1851.

As a breeder of short-horned cattle and new Leicester sheep the name of Mr. John Beasley, of Chapel Brampton, is well known beyond the county he resides in. A detailed description of the management of his farm at Overstone will, we are confident, prove generally useful and instructive. It contains altogether about 727 acres, 420 of which are arable, and 300 pasture. Three-fourths of the whole are a "convertible" soil, a good red loam upon a substratum of red sandstone, which is in parts very near the surface. Some portions have a considerable admixture of sand, and the soil there is consequently weaker. The remainder of the farm is a strong soil lying on very stiff clay.

The whole of this portion of the farm, the clay-land, has been underdrained. The drains are made in straight lines, seven yards apart, without any regard to the old high-backed crooked lands. They are dug to a depth of three to four feet, a pipe-tile aid at the bottom, and over it broken stones about nine inches in depth. The drains being very narrow at the bottom, few stones are required, a cartload sufficing for four chains in length, and, as the stones are got on the farm from the red land, the cost is not much increased. The whole expense amounts to £4 10s. an acre. When the land is drained it is ploughed, harrowed, scuffled, and worked across the high-backed crooked ridges, which are thus gradually levelled, and there is said to be no perceptible difference between the crops on the ridges and furrows. If the stones on the tiles answer no other purpose, they assist the drainage in the first two or three years, for the water does not find its way very quickly to a depth of three or four feet on strong clay soils, which perhaps have never before been moved more than four inches. By degrees the clay soil will crack to a considerable depth, when the air has been secured an entrance, and that is materially assisted by the subsequent processes of deep ploughing and subsoiling. If the draining is made more efficient by the addition of the stones for the first two or three years the expense will be repaid, and the drain is not so liable to accident by the breaking of a tile, or the stopping up of one. Where the stones can be cheaply got this practice may be advisable; but any advantages it possesses are not sufficient to justify any considerable outlay, as it has been abundantly proved that tile-drains at this depth and distance will, if pro-

perly constructed, effect perfect drainage. The drainage is carried off by a brook, in which an increased fall has been obtained by making it deeper, wider, and straight in its course, and which has at the same time greatly improved the drainage of the adjoining land. This land is now perfectly dry, and can be worked at almost any season of the year. One field was trenched or dug with spades to the depth of 14 inches. It was first manured, the labourers digging-in the manure and picking out any twitch or weeds as they went on. It was not touched again until the end of April, when it was drilled on the flat with mangold-wurzel, and produced a good crop where anything approaching to a good crop of vegetables had never before been seen. The digging cost £2 per acre, and supplied work at a time when it was very scarce. Some of the men, by working hard, earned 10s. a-week.

Over the whole of the arable land the old fences have been taken up and new ones planted, and the fields made of the same size, 21 acres each. Five of these fields, or 105 acres, are in the same description of crop every year; three adjoining fields on one side of the farm and two on the other. The same description of work is thus always being carried on at the same place. The hedges are kept very low and neatly trimmed, occupying the smallest portion of land. There are no ditches, tile-drains supplying their place where necessary. The fields are all square, being the same width at both ends, except where a public road interferes, when the unequal side is put next to the road, so that the field is ploughed square up to a small portion of the last part. So perfectly square are these fields that the ridges for the turnips, as well as the drills for the corn, are frequently commenced in the middle of the field and finished on each side up to the hedges, the last row running in a perfectly straight line with the hedge. The old and bad trees have all been grubbed up; the best oaks, and they are very fine, having been left in the open fields, wherever they happen to have stood, with excellent effect.

The whole of the farm is managed on the four-course rotation—turnips, barley, clover, wheat, 105 acres of each. On the heavy land, now that it is drained, white turnips are grown, to be eaten off early, and mangold and cabbage answer very well. The general management begins with the wheat stubbles, which are ploughed early in the autumn six inches deep, with the common Scotch iron plough with two horses abreast. About one-third, or as much as can be got through in a season, is subsoiled with Grey's subsoil-plough eight inches, making in all 14 inches. The horses attached to the common plough walk on the unploughed land so as not to trample on the furrow which has been subsoiled. The land is left in this state through the winter. In spring, when it is sufficiently dry, a scuffler is drawn across the furrows, which, where the land has been subsoiled, will work to the same depth it has been ploughed. The land is then rolled and harrowed, and the twitch brought to the surface and picked off. The whole force of the farm is applied to one field at a time; and when the whole of the twitch, brought to the surface, has been removed, the field is left for a time. It is again ploughed, then scuffled, harrowed, and picked as before; and this is repeated until it is perfectly clean. The practice of autumn cleaning adopted by Mr. Outhwaite of Bainesse, and described in a former letter, might, we have no doubt, be introduced here with great advantage, as such repeated turning over and exposure of a dry soil in the hot sunny weather of April or May must sometimes render a plant precarious. When the turnip-sowing commences the land is ploughed into ridges 25 inches apart, and 20 loads of good rotten farmyard dung is placed in the ridges and covered up. The seed (2 lbs. per acre) is then drilled on them with Hornsby's drill, with concave rollers, made in the shape of an hour-glass, and which give a good finish to the work. Part of the dung which is made in the autumn and early part of winter is carted out upon the cleanest wheat stubbles, and immediately spread and ploughed in. This saves a great deal of labour at the turnip-sowing time, and expedites the work.

The dung is never removed from the yards except to be applied directly to the land. In the yards it is trampled very firmly by an unusual number of cattle: the buildings are all spouted, and drains are laid from all the yards and feeding-houses to the liquid-tanks. The manure heaps are carefully levelled on the top every day, and, if too dry in the spring of the year, the liquid from the tanks is thrown over them. When turnip-sowing commences the top of the manure heap is laid aside, and the rest carted away and at once put into the ground. The top of the heaps and the spring-made manure are thrown up and turned over to cause fermentation, and so get them sufficiently decomposed for application to the turnip crop. No artificial manure is used for turnips; linseed cake, beans, and barley being consumed by fattening cattle to a considerable extent, and the farm-yard dung being thus all of good quality.

About 20 acres of the wheat stubbles are sown in the autumn with vetches, a slight dressing of dung being first applied. They are drilled at the rate of three bushels to the acre, and the young plants are watered with liquid manure in the winter and spring. A small portion of these vetches are cut for the horses, the remainder are fed off early with sheep, which are kept in folds, the vetches being mown and put into cribs. The land is then ploughed, and cleaned for turnips.

About two-thirds of the green crop land are sown with swedes, the remainder with white turnips, mangold, cabbage, and potatoes. The first swedes are sown about the last week in May, and the whole are completed by the beginning of July. Earlier sowing is found to be attended with much greater risk of mildew in autumn. The crops average upwards of 20 tons an acre, and when all eaten on the land are found equal to the keep of 20 sheep an acre for 20 weeks. They are hand-hoed three times at a cost of 8s. per acre, and horse-hoed four times at a cost of 4s., by which perfect cleanliness is attained, there not being a weed or a particle of twitch to be seen in the autumn. In November and the beginning of December the swedes are pulled up, cleaned, thrown into conical heaps on the field, and covered with soil, a light coating of stubble being previously laid on. When

the turnips are stacked without any straw between them and the soil, they are found to be very dirty in wet weather, and in that state they purge the sheep. This operation costs 6s. per acre. Every third heap is carted off and consumed in the fold-yards by cattle; the rest are eaten by sheep on the ground, the turnips being cut with Gardner's turnip-cutter and given in troughs. The whole of the sheep have chopped hay or clover with their turnips, and the fattening sheep cake or corn also. The hoggets and ewes have neither, except some weak ones; but the sheep which have cake or corn exchange peas regularly with those which have only turnips and hay, that the land may be equally manured.

In preparation for barley, the land, as the turnips are consumed, is ploughed five inches deep. Barley-sowing commences in the first week of March, and is finished about the 5th of April. Three bushels and a half of Chevalier barley are drilled to the acre, and the average produce for the last eight years has been 45 bushels 1 peck, the quality good, weighing 55 lbs. per bushel, and fetching the highest market-price.

The grass seeds sown with the barley consist of the following mixture:—Two-fifths or three-fifths with 10 lbs. of red clover, 3 lbs. of white clover, 3 lbs. of trefoil, 1 peck of Italian rye-grass, and half a peck of common rye-grass per acre. The remainder is sown with 10 lbs. of white clover, and the same quantity of trefoil and rye-grass as above. Beans and peas have been tried in the place of clover, to produce a more varied course; but the crops were light, the land being too dry for them, and the wheat was much lighter than when sown upon the clover ley, solidity of soil being considered of the first importance to wheat on this kind of land. Two of the five clover fields are mown for hay, and three depastured with sheep and young calves. The sheep are folded during the night.

For wheat, the ploughing of the clover ley begins about the 10th of September, and the wheat is generally all in by the 20th of October. The first sown is drilled at eight inches apart with 2½ bushels, the last with 3 bushels an acre of Valpin's red Spalding wheat, which is the only sort now grown on this farm, having been found most productive and of good quality, weighing 62 lbs. per bushel. The average crop for the six years preceding 1849 has been 34½ bushels an acre. The crops of 1849 and 1850 are not yet thrashed, but are estimated at much more. Immediately after the wheat is sown the land is pressed with Crosskill's clod-crusher, and, if the weather admits, it is again pressed in the same way in spring. Eight cwt. of salt to the acre is sown upon the wheat, four cwt. in autumn, and four cwt. in spring. This is found to give solidity to the land, while it checks the weeds, prevents mildew, blight, and rust, and improves the quality and increases the produce of the crop. On the clay soil portions of the farm the application of salt has been discontinued, as it was found to keep the land too damp and sad, and to give the wheat a starved and unhealthy appearance. The wheat is always hoed between the rows, but Mr. Beasley is of opinion that if the land could be kept perfectly clean without hoeing it would be better, as the hoeing, by cutting the small fibres, has a tendency to let the wheat fall.

We must make a short digression to explain Mr. Beasley's reason for sowing so thickly on land in every way so well prepared and in such high condition. He does it on the principle that corn ought not to tiller. If the plants are sufficiently thick in spring they at once send up the stalk; but if the roots are thin they send out lateral shoots, which strike in the earth and produce new plants. The first plant is weakened by having to produce auxiliary plants, and the plants of the second growth do not come to maturity so early as the original or parent plant. The quality of the crop is thus injured, as there are always more light and defective corns in a thin-sown than in a thick-sown crop; besides that there is less seed to meet the contingencies of wireworm, grub, or very severe weather.

The accommodation of the stock and crop is provided for in a set of farm buildings, which have been erected, at a moderate cost, out of the materials of two old ones, with the aid of larch timber and stone procured on the estate. The buildings are on a large scale, but compact, and in the centre of the Overstone farm. They include a house for a steam-engine which drives thrashing machinery, millstones, saw-mill, and turnip-cutter. The waste steam can be used for steaming food. The thrashing and dressing of the corn, including coals and oil, costs 1s. 3d. per quarter. The feeding-houses are 15 feet wide, with a manger, rack, and water-trough at the head of the cattle. The cattle are tied by the neck in pairs, in stalls 8 feet wide. They are well littered and kept perfectly clean. The water is supplied by a pipe from the well in the yard, and when one trough is full it supplies the next until all are full. The young stock are kept loose in yards, with shelter-sheds, and the in-calf heifers and cows are kept in the yards, where the manure from the feeding-houses is emptied, which they compress by treading.

The stock is of the improved short-horn breed, bred with much care for many years, chiefly from the stock of the late Earl Spencer, and crossed with bulls from Sir Charles Knightley and other eminent breeders. About 35 cows and heifers are kept for breeding, 40 calves being reared every year, a few of the best that can be got being bought to make up this number. The calves begin to fall in February, and continue till Midsummer. About six of these are sold for bulls by the time they are a year old. For the first fortnight the calves have new milk, for another fortnight half new and half skim; afterwards skim milk, mixed with linseed porridge. They are turned out into the young clover very early, returning to open sheds at first for the night, where they receive bruised oats, or cake, as soon as they will eat, and until they are able to gather a living for themselves by grazing. The first winter the calves are kept in four paddocks, in each of which there is an open shed, in which they are fed with turnips and hay, and the youngest with 2 lbs. of cake a-day in addition. In spring they are turned out to grass with the ewes and lambs, and remain on the pastures till Christmas, when they are brought into the foldyard to straw and turnips. They are kept in the same way

for another year, and, when nearly three years old, they are placed in the feeding pastures, which are not very good, and in autumn in the aftermaths. In November they are tied up in their stalls in the feeding-houses, when, after a short time, they are placed upon full feeding. They are fed four times a-day, and their daily supply consists of

	s.	d.
7 lbs. of linseed cake, at 3½ farthings per lb.	0	6
1 gallon of beans ground into meal, at 32s. per quarter, including grinding	0	6
1 bushel of swedes, at 3d. (10s. per ton)	0	3
8 lbs. of hay, at £3 10s. per ton	0	3
	1	6,

or 10s. 6d. per week for the last eight or ten weeks. In the middle of February they are sold by auction on the farm with the fat sheep. The average price last year was £22 2s. 2d., including some old cows, but they scarcely made 5d. per lb. At this price it is very doubtful whether this mode of rearing and feeding is profitable. Earlier maturity, we are convinced, would pay better, and we have often seen cattle of inferior breeding, and on no better land, made fat in half the time—certainly not the same weight, but fetching greatly more than half the money.

We now come to the management of the sheep stock, which are of the new Leicester breed, bred from the best flocks since the days of Bakewell. The ewes, 350 in number, rear about the same number of lambs, but they are for the most part bad nurses, and, the lambs being consequently small, are taken early from their dams and put upon clover or good pasture until November, when they are placed upon turnips during the winter, as already described. In the spring the ewe hoggets are put into a store pasture, and the wethers are grazed upon vetches and clover. In the autumn the draught ewes and theaves, and the whole of the wethers, are put to turnips, when they also receive a pint of beans or a pound of linseed cake per day, whichever is to be had cheapest. As many shearling wethers are bought in summer as are required to consume the turnips, besides those bred on the farm. They are all treated alike, and are sold fat in February by auction. Last year the average price was 46s. 7d. These sheep clip on an average 6 lbs. of fine long wool.

The whole stock on the farm in February, 1838, was 77 cattle, 525 sheep, and 25 pigs. In February, 1849, there were 134 cattle, 879 sheep, and 33 pigs. The farm was then 520 acres in extent. 200 acres have since been added; and in February, 1851, there were 202 cattle, 1,017 sheep, and 70 pigs. Mr. Beasley intends to increase the sheep stock to 1,300, and to diminish the number of cattle in the same proportion.

The labour of the farm costs 19s. 6d. an acre for the whole, or 28s. an acre for the arable, and 7s. for the pasture. The labourers are receiving 9s., 10s., 11s., and 12s. per week, according to their ability, character, and the time they have worked upon the farm. They have all been reduced 1s. per week since last year. Much of the work is done as task work. With the exception of the strong land, the farm is light and easy to manage, and the arrangements of the fields and buildings greatly facilitates and economizes labour.

A leading object on this farm has been to make as much good manure as possible. To effect this a very large stock is kept, all of which are well fed, and a considerable quantity of artificial food is consumed. Where the relative values of different kinds of food do not greatly differ, feeding cattle will generally thrive best upon a variety. One-third of all the turnips grown upon the farm are consumed in the stalls and yards by cattle. These, with 60 acres of meadow-hay, 40 acres of clover, and the straw from all the corn crops, make up the materials for the manufacture of manure. The quantity made has gradually increased, and the crops are likewise increasing. The condition of the farm is aided by the sheep being partly fed with artificial food. It has been now brought to a point of cleanliness and condition that the corn crops scarcely admit of increase. If the barley crop is made much more luxuriant the straw will be more productive than the corn, and the quality will be apt to deteriorate. It therefore becomes a question whether the four course should be continued, or whether the farm has now reached the point at which successive corn crops might be occasionally taken with advantage.

The experienced reader cannot fail to remark the lengthened period which this very high bred stock takes to arrive at maturity. This is somewhat unusual, and appears to us the most vulnerable point in Mr. Beasley's management. The chief excellence of short-horns consists in their earlier maturity than any other breed, for which we are willing to sacrifice in some degree the quality of the meat; but if we are to keep them till four years old we lose this advantage, and might as well feed West Highlanders or Welsh runts, as they would get fat at that age, and be of much primer quality. The high bred Leicester sheep, too, have the failing of being bad nurses, and not prolific. They do not appear to have any countervailing advantage, as, with the same feeding and at the same age, any of our good crosses would give as much money. It would thus appear thet merely for feeding purposes it is unnecessary to spend money on very highly bred stock, as Mr. Beasley, with the best short-horn and the purest Leicester blood in England, gets neither earlier maturity nor greater weights than many farmers with stock of very inferior breeding.

We make no apology for occupying so much space with a detailed description of Mr. Beasley's farm. It comprises within itself an instructive little treatise on agriculture, affording much matter for reflection, and many points of comparison to the skilful practical farmer.

HADLEIGH FARMERS' CLUB AND ASSOCIATION.

The annual show of this society was held at Hadleigh, on Friday, the 14th of May last, in Mr. Strutt's meadow, and was a most excellent one. The horse stock attracted the greatest share of attention, being particularly good, especially in the department of the geldings. Mr. Robt. Kersey's two-year-old and year-old fillies, by Mr. Catlin's Royal Windsor Duke, were much admired. Of cattle there was a short supply; but some capital animals were exhibited by the Rev. J. Y. Cooke, and others. There were several pens of superior sheep; the Downs were of prime quality, but were deficient in keep. The swine were not altogether first-rate, but there were one or two very excellent animals in this class. The judges of stock were Mr. H. Crosse, of Boyton Hall; Mr. B. M. Lungley, of Boxford; and Mr. Clover, of Creeting.

The ploughing took place partly in a field of Mr. Caleb Kersey, and partly on Messrs. Rand's occupation, and was well executed, but the land was in such a state that the work could not be seen to any advantage. The shearing was well performed.

In the afternoon about 80 gentlemen partook of an excellent dinner at the newly-erected Town Hall, of which this meeting was the inauguration. R. Kersey, Esq., the Chairman of the club, presided, and was supported, right and left, by the High Sheriff of the County (J. L. Anstruther, Esq.), the Hon. and Rev. F. De Grey, the Rev. H. B. Knox, the Rev. J. Y. Cooke, the Rev. W. E. Downes, R. Baker, Esq. (Writtle), — Baiker, Esq. (Chairman of the Ramsey Farmers' Club), J. Growse, Esq., and several of the professional gentlemen of Hadleigh, and the principal farmers in the district.

The cloth being removed,

The CHAIRMAN said they were assembled in the Town Hall for the transaction of business connected with the agricultural association established in Hadleigh; and he thought they could not have a convivial meeting in that room for a better object than that which they were met to promote. He would give the health of our gracious sovereign, and as it was the first time the toast had been proposed in that hall, he would call upon the meeting to drink it with three times three.

"Prince Albert, the Prince of Wales, and the rest of the Royal Family;" "the Army and Navy," were next given.

The CHAIRMAN said it afforded the members of the association great pleasure to see their esteemed and worthy rector always coming amongst them on these occasions. He was very glad to see that none of his ministerial duties, or any other engagements, real or feigned, ever prevented his attending the annual meetings to promote the objects of the association. He could wish that the society had sufficient powers of attraction to bring all the clergy in that part of the diocese to meet them at their annual gatherings; still there were more of them present on this occasion than in some former years. He was pleased to find many of the clergy and gentry now giving their patronage and support, which were so calculated to encourage the members to increased efforts to carry out the objects of the association. "The Clergy of the Diocese," was then given, coupled with the health of Mr. Knox (loud cheers).

The Rev. H. B. KNOX, in acknowledging the toast, said it must be some occasion, disagreeable indeed in itself, which would keep him from being present on such occasions as this. He always made it a point to attend the meetings of the association as a matter of duty, as well as of inclination (cheers). He was always proud to support Mr. Kersey in this, or in any other cause, and where that gentleman so well led he was happy to follow (cheers). There had been usually some remarks made at these meetings as to the paucity of clergymen present—he was happy to find the number increased this year; but though many were not with them, he believed he might say with truth that their hearts were with an association, the object of which was to promote the interests of agriculture, and more especially the welfare and happiness of the labouring classes. While these associations stood up for those classes, the clergy, he was sure, would stand up in support of these associations (loud cheers).

The CHAIRMAN thought that he might congratulate the meeting upon the growing interest manifested towards the objects of this association, when they found they had the honour and pleasure of having the High Sheriff of the County amongst them (loud cheering). As he was compelled to speak in that gentleman's presence, he should do so in as delicate a manner as possible; but he must say that he was held in the highest estimation by the public generally for the very impartial manner in which he was discharging the duties of his high office. If he were to express his feelings in respect to the high sheriff, in terms commensurate with those feelings, Mr. Anstruther perhaps might be

led to suppose that he was offering him something like an unnecessary compliment; but he certainly should do no less than justice, while proposing his health, in saying that he was one of the best landlords in the county of Suffolk (great and continued cheering). He might be forgiven if, in Mr. Anstruther's presence, he took the opportunity of conveying to his mind the high estimation in which he was held by his tenantry (loud cheers); for he could honestly say that he scarcely ever attended a social meeting amongst the farmers in that locality, without hearing his tenants proposing the high sheriff's health, in language which he should not attempt to repeat. This fact, and the fact of his filling so high an office in the county, would justify him in giving the health of the high sheriff with three times three (one cheer more was heartily added).

The High Sheriff begged to thank the meeting most sincerely for the high honour which had been paid to him. He felt that Mr. Kersey had really placed him in a most difficult position, for he had introduced the toast with observations which he felt he was not worthy of (cries of "No, no!). He gladly availed himself of the opportunity afforded him of expressing his high gratification in witnessing the interesting exhibition that day. He thought the stock show a most meritorious one, and highly creditable to the locality; he was sure the gentlemen who were fortunate enough to gain prizes had great reason to be proud; while those, on the other hand, who were unsuccessful, had no reason to be ashamed; he knew that their want of success would only stimulate them to greater efforts, and he would, therefore, only wish they might be more successful in future. He had had great pleasure in again enrolling himself as a member of the association. He regretted that his absence from home had prevented his attending their meetings as he could wish to have done; but he rejoiced to have heard that the association was in a flourishing condition. He thought it particularly creditable that, notwithstanding the unpropitious events of late years, such should be the case. He considered that these societies were deserving of every possible support, and he hoped it would be accorded to them, because they were instrumental in doing a great deal of good, not only by promoting harmony in the neighbourhood, but by exciting rivalry and emulation, in stimulating to exertions which must tend to the advantage of agricultural science generally. He rejoiced that the prizes of this association were not confined to stock, but that a great portion of them were assigned to the industrious agricultural labourer; this was a class of men who, he feared, were generally too much overlooked, and it was therefore highly creditable to the association that it paid so much attention to this peculiar object. On the grounds he had mentioned he would urge upon all to lend their assistance to the association in every possible way (cheers).

The Chairman said that whatever differences of opinion there might be on political subjects, there would be no difference as to the sentiment he was about to express, which was that the members for the County of Suffolk had acted as most consistent men, and had never compromised their principles (cheers). He thought he might say they had discharged their Parliamentary duties with a firmness of intention, and with an honesty of heart and purpose, that were deserving, at all events, of the thanks of the constituency (cheers). They had always endeavoured to aim at what he had no doubt they thought most calculated to promote the interests of the country on the one hand, and the interests of the constituency on the other. He would propose the healths of "the Members for the County" (loud cheers).

The Chairman then said that having had the pleasure of proposing the Clergy in the Diocese, he would now give the healths of the Clergy out of the Diocese, and amongst their number he was very happy to introduce to the meeting the Hon. and Rev. Frederick De Grey, a gentleman who had recently joined their association (cheers). He congratulated the members on such an accession, and he would take the liberty at the same time of congratulating Mr. De Grey on joining such an association (cheers).

The Hon. and Rev. Mr. De Grey, in returning thanks, said he sincerely congratulated himself on having the honour of belonging to so interesting an association as that. He had heard of the society for many years, and had on two or three occasions attempted to be present at its meetings, but had always hitherto been thwarted when the day came. He felt more particularly gratified in belonging to the association, from the circumstance of finding that three or four of the prizes to be awarded that day were gained by farmers in his parish—a fact extremely gratifying to him, almost as much so as it must be to the gentlemen themselves (cheers).

The Chairman would propose the health of a practical as well as an experimental agriculturist, and whom they had had the pleasure before of seeing at their meetings—Mr. Robt. Baker, of Writtle (loud cheers).

Mr. Baker, in returning thanks, assured them that whatever position he might be placed in, so long as he found that position to be amougst agriculturists and farmers, he felt more especially happy in it than in any other. His lot was cast amongst agriculturists, and he trusted that he

should so conduct himself through life as to be always received by them with the same pleasure as he hoped he had been received with that day. There was a rule on all occasions like the present, which would prohibit him from speaking on a subject which he should most like to touch upon—namely, the position of the farmer. But amongst other matters which might properly be discussed, there was one which had rather impressed itself on his mind—it was the comparative position of the farmer in the present and in the past periods. The *Times'* Commissioners had entered into an investigation upon this point, and had published some very valuable and interesting documents, which those who had not hitherto seen might read in a book which had been published containing the report of the Commissioners; the general conclusion was arrived at, on a comparison of prices between 1770 and the present time, that wheat at the present time was some fifteen or twenty per cent. cheaper than in 1770; but the Commissioners went on to meat, butter, and cheese, and these were some thirty to forty per cent. higher in price; therefore those who grazed most meat, and produced most butter and cheese, would probably succeed more than those who produced a large quantity of wheat. Now all farmers could not adapt their cultivation to these particular articles; but it was a most important subject, and one which required the consideration of every one, why meat should be dearer at the present period than in 1770; and still grazing was not a profitable part of farming? It was said by some that it was because the farmers bought the lean animal too dear. That might be one reason; but there was another which overruled that, viz., that there was an improvement in the race of animals in the present day over those purchased 100 years ago; and, in the period during which he had been a farmer and grazier, that which it formerly took eight or nine months to effect was now effected in three or four months; the improved mode of feeding animals and the improvement in stock had given considerable advantage in this respect. Every one was aware of the great improvement in neat stock in the last 50 years, and in sheep stock; every one knew that early maturity might now be introduced into the breed of an animal so as to ensure an opportunity of fattening it in half the usual time. With all these opportunities why was the grazier placed in such a difficult position? Because the introduction of the turnip, mangel wurzel, and the root crop was so great, and the introduction of guano had so accelerated the growth of them, that the demand for lean animals had doubled; the quantity of fat meat had likewise doubled without double the demand for it, so that in the latter respect the market was over glutted, while in lean animals there was not sufficient production to meet the demand. He held that if the farmers, even in these districts, were to pay sufficient attention to the rearing of stock and to the fattening of that stock, they would to some extent overcome the difficulty complained of. It was said that it took so long a process to rear stock, and that the land in these districts was not adapted to it, and therefore that it was much better to purchase and fatten than to rear stock. With the little experience he had had he would contradict this assertion, for he was sure that with an improved race of animals, such as had that day been exhibited, and if those animals could be procured for the purpose of breeding from, which they might be, their early maturity was such that animals of very superior quality, not only in point of condition and fatness, but likewise in point of size, might be produced and got to market in the short space of twenty-four months. He was not speaking on mere assertion, but from sound practical experience. He had effected this object himself; and a gentleman on his left (the Rev. Mr. Cooke) he was sure would corroborate the fact that animals of from £15 to £20 value might be produced in that period, if properly reared, and if a proper mode of fattening were pursued, by keeping on in a progressive state of improvement; therefore if the breeder had any advantage over the grazier, that advantage might be obtained by the party who filled both positions. (Hear, hear). He always held that meetings of this character should be practical and useful; it was no use to meet for improvements in stock and horses, unless the farmers met also for the improvement of themselves; there was no use in progress as regarded the animal, unless it were carried out as regarded the man—if that were not the aim sought to be attained, such meetings would be to no purpose (cheers). It was the most important part of the business of a farmer in the present day to make the most he could from his farm; and he was sure, whatever was the condition of his occupation, such were the opportunities of producing root and green crops, that every farmer would be in a position to rear enough stock necessary for his farm to maintain. (Hear, hear). He had seen the plan he recommended pursued with advantage, and, to a great extent, on farms where formerly no stock was usually kept. In Essex, the practice of the farmer hitherto had been to sell his calves, and to attend the market nearest him to buy an inferior description of animal, reduced to the lowest stage of poverty, which it took half as long to put into a condition to fatten for the shambles as it would take to rear one; on the other hand, he had purchased the best calves that could be produced, over

and above those he had reared, and he had sold animals, two years of age, averaging from 80 to 100 stone, and which had never had anything not produced on the farm, except a small portion of oil-cake. With a purchased animal, if the grazier obtained £5 or £6 over the purchase-money for the keep of it, it was considered that he made a tolerable profit on the grazing; but if he reared animals, and the calves were well managed, he contended they might be made to produce on a moderate calculation from £10 to £15 each. If they thought £5 a good profit on a full-grown animal purchased, and could realize £15 on that which was only a calf when they first commenced with it, he would ask which was the best practice? (cheers). Although he came from a distant county he did not attend the meeting with a view of laying down precepts and principles in which he was quite sure they were more experienced than himself, but when Sir Robert Peel on various occasions addressed his tenants and talked of their rubbing their minds together, he did so with the same object as he (Mr. Baker) had in view in making his present remarks. He did not aspire to know more than they did, or to communicate anything to men more practical than himself; but there were many common things on which they might not have fixed their attention, in consequence of their being too common to be noticed. The farmers were too much creatures of habit, too apt to tread in the path their forefathers walked in, and to adopt a particular system; but circumstances were so altered now that farmers must look about them. The introduction of railways and the facilities of water-carriage made distant places approximate now to London, which before had not been the first market for their meat. Scotland could send animals to London on as easy terms as the farmers of Suffolk, and could compete with them in that market; the consequence was that they kept the best of their stock now to fatten for the London market, and introduced their worst description of animals into these counties to be sold for fattening. There was one subject which he wished to advert to—the propagation of the beet root for the purposes of brewing. He himself had applied it so extensively as to be able to speak confidently on the subject. He would say that every farmer might produce sufficient beet root on half an acre of land to supply all his labourers and household with beer—not ordinary, but good beer—under proper management as good as from malt itself. The workmen on his farm had drunk it for the last five or six months, and they were all perfectly satisfied with it. He drunk it in his own house, and he found his friends often asking him where he bought his porter, and a gentleman from London declared it was better than either beer or porter from malt. He thought the farmer would be benefited by using beet for this purpose. (A Voice: "What shall we do with the barleys?") He was glad that question was asked, because he thought he could answer it in a way perfectly satisfactory to the majority of those present. It was well known that if there were no malt-tax there would at the present moment be double the quantity of malt consumed in this country. He had shown them how to produce an article free from the tax; if malt made from barley were as cheap as it might be if the tax were not added, he should not think the adoption of the beet for beer of any advantage to the farmer; but in consequence of the malt from beet not being taxed the beer could be procured 200 per cent. cheaper than if made with malt from barley. The use of beet for beer would go far to promote the repeal of the malt-tax, and if that tax were taken off to-morrow, he was sure that double the quantity of barley now grown or malted would not be sufficient. Let them avail themselves of a useful article for their own benefit, and that of their servants, and they could do so where no other individuals could, and he was convinced that it would eventually prove a boon to the farmers (cheers).

Mr. Joseph Rand proposed the health of their esteemed Chairman, Mr. Kersey—(loud cheers)—remarking how much the Association was indebted to him for the great interest he took in its prosperity, and for the admirable manner in which he conducted the duties of its presidency. He trusted they might see that gentleman for many years to come, occupying the office which he now so ably filled. He would couple with Mr. Kersey's health the toast of Prosperity to the Hadleigh Farmers' Club and Association.

Mr. Kersey rose amidst much cheering, and, in returning thanks, expressed the great interest he felt in the success of the association, and in the promotion of its objects. He considered that, when the members came together on occasions like the present, they met to stamp a kind of dignity upon labour, and to pay a species of tribute and respect to good character and to industry. It was most gratifiying to have been in the ploughing field, and to witness the competition there. It had convinced him that very day of the striking connection there was between the employer and the employed, between the master and the servant, and as he might also take the opportunity of stating, between capital and labour. He would just ask what would be the condition of our agricultural districts, or what the condition of the masses of England, if they had not such a thing as remunerative labour? If there were no remunerative labour in this country and in our districts, and if capital were

extinquished or withdrawn, it would pauperise every family, every parish, and, he contended, every county. A meeting such as that regarded the labouring class with the greatest interest, looking on them as men of sterling character and of great worth, associated with themselves and with the higher classes, in rearing up the social fabric of the country and giving stability to its institutions; but just withhold remunerative labour, and the seeds of discord and discontent would be sown, and would ripen eventually to a harvest of dissolution and bloodshed. Whenever he returned home from meetings of this association, he could never help regarding his men, and every man who had been a competitor for prizes, as casting a kind of moral influence amongst his fellow-men on the farm—it reminded him of the time when he was a boy standing on a bank, and casting a stone into the water—the rippling spread over its whole surface; just the same was the influence which such men extended over the minds of their fellow-men when brought into contact with them. The best workman on a farm, the most successful labourer, was always the man who in other respect set the noblest example to his fellow-labourers (cheers). They frequently heard, in conversation on the state of the country, while there was an admission of the poverty and pauperism extending on the right and left, and of the fearful consequences springing therefrom, a kind of panacea suggested for the removal of those ills; a great cry was made throughout the length and breadth of the land, and re-echoed, of "educate, educate, educate!" He would educate too—he would place within the reach of every man the means of acquiring good, sound, practical knowledge; but in doing so he would endeavour to implant in his bosom the principles by which he might know how to exercise that moral power with which he was invested; he would give him every opportunity to increase in practical knowledge; he would have no mind uncultivated, and no understanding unenlightened; but, at the same time, what was education without employment?—what would be the state and condition of their labourers, however enlightened they might be, whatever knowledge they might acquire, without that remunerating labour which was essential to their domestic comfort and happiness? He would merely conclude his observations by expressing a hope that long might the Hadleigh Farmers' Club and Association prosper, long might its members continue to support it, and hundreds yet to come share in the blessings it was calculated to bestow (cheers).

The Rev. H. B. Knox in complimentary terms proposed the health of the Vice-President, Mr. Joseph Rand. (Cheers.)

Mr. Rand returned thanks. He had been much delighted at that day's exhibition, for he liked to see good stock reared and brought to early maturity, and he was glad to find so much competition. He did not recollect an occasion when he had been less fortunate in obtaining prizes; but, as his esteemed landlord, the High Sheriff, had observed, the unsuccessful competitors had no reason to be ashamed of their stock: still, they must put their shoulders to the wheel again, instead of being cast down in consequence of being once beaten: he could only say it would make him more energetic in the production of good animals. (Cheers.)

The prizes for long servitude, shearing, ploughing, &c., were then distributed:—

Samuel Bloyse, having subscribed 47 years to an enrolled benefit society, 2*l.*; John King, 50 years' service with Mr. Hugh Green, Boxford, 2*l.*; John Whyman, 47 years' service with Mr. Robert Partridge, 2*l.*; Ann Jarrod, 11½ years' service with Mr. Cook, 2*l.* *Shepherds.*—Samuel Alderton, having reared 260 lambs from 161 ewes, with the loss of 4 ewes, 1*l.* 10s.; William Wright, 210 lambs from 135 ewes, 4 lost, 1*l.*; Charles Wiseman, 292 from 192 ewes, 10 lost, 10s. *Shearers.*—John Deaves, 1*l.* 10s.; James Ramplin, 1*l.*; William Goss, 10s. *Ploughmen. Class I.*—John Sage, 2*l.*; William Sage, 1*l.* 10s.; George Wright, 1*l.* *Class II.*—John Green, 1*l.* 15s.; Thomas Pratt, 1*l.* 5s.; William Barton, 15s. *Boys.*—James Munson, 1*l.*; Charles Hasell, 15s

The following were the prizes awarded for Stock, &c.:—Cart stallion, Mr. James Warren, 2*l.* Brood cart mare, Mr. Robert Kersey, 2*l.*; second best ditto, Mr. James Gentry, 1*l.* Gelding, ditto, 1*l.* 10s. (All the other geldings were commended.) Cart colt or gelding, Mr. J. Everitt (Polstead), 1*l.* Cart Filly, Mr. Robert Kersey, 1*l.* Cart colt or gelding, Mr. Thomas Partridge, 15s. Cart filly, Mr. R. Kersey, 15s. Bull, Rev. J. Y. Cooke, 1*l.* 10s. Horned cow, ditto, 1*l.* Polled cow of any breed, Mr. Cable Kersey, 1*l.* Shearling Southdown Tup, Mr. T. Partridge, 15s. Southdown tup, of any age, Mr. Thomas Hawkins, 15s. Shearling short-wool tup, no exhibitor. Tup of any age, of short-wool breed, Messrs. R. and J. Rand, 15s. Long-wool shearling tup, ditto, 15s. Long-wool tup of any other age, Mr. H. Partridge, 15s. Five Southdown wether hoggets, Mr. T. Hawkins, 1*l.* Five ewe hoggets, ditto, 1*l.* Five wether hoggets, of any other short-wool breed, Mr. John Daking, 1*l.* Five ewe hoggets, of any other short-wool breed, ditto, 1*l.* Five wether hoggets, long-wool breed, ditto 1*l.* Five ewe hoggets, long-wool breed, ditto, 1*l.* Fleece of hogget short-wool, Mr. Thomas Cooper, Ardley Wick, 15s.; fleece hogget long-wool, ditto, 15s. Boar, large breed, Rev. J. Y. Cooke, 15s.; ditto, small breed, Mr. Warren, 15s. Breeding sow, large breed, Rev. J. Y. Cooke, 15s.; ditto, small breed, Mr. H Partridge, 15s. Fat heifer, Rev. J. Y. Cooke, 1*l.* 10s.; second-best ditto, Messrs. R. and J. Rand, 1*l.*

Mr. Robert Rand proposed the health of "the Judges of the Stock."

Mr. H. Crosse, in returning thanks, said the stock exhibited was very much above that which he wit-

nessed three or four years ago; the horses and the colts were decidedly superior. He at that time had made the remark that there was a want of quality, but he must now remark that if they attended too much to quality he feared they would lose size. In much of the stock exhibited there was beautiful quality, great activity, and perhaps good constitution, but hardly enough force, he should think, for the strong soil of this country. In the sheep department the Judges had great difficulty in satisfying themselves, particularly as to the tups, which were first shewn in the wool and then shorn, and which were in competition with some shorn a month ago from a misunderstanding as to the rules. The wind being very high, they so stuck up their backs that they could not be judged of so well, and seemed so horribly cold that he did not like the look of them half so much as before. Some of the neat stock were remarkably good. In awarding the prizes for cows, they had ventured, perhaps wrongly, to pick out one or two poor animals, with every disposition to fatten if they had the chance, but which for their milking qualities were likely every night and morning to bring in profit to their owners. He would remark that the Judges would have liked to have seen more of the horses' heads, but many of them were so covered up with brass, and the dutfins were so large, that they could not be seen.

Mr. Robt. Partridge proposed the health of Mr. Grimwade, the able Secretary to the Association.

Mr. Grimwade returned thanks. It must be gratifying to the members to see, at a time like the present, such an exhibition of stock, and a meeting so well attended. He hoped that this would inspire them with courage, and be an augury of greater prosperity for the future.

Mr. Norman proposed the health of Mr. Clayden, the Treasurer.

Mr. Clayden acknowledged the compliment, and had the pleasure of stating that on this, as on former occasions, his coffers were pretty well lined. (Cheers.) He felt pleasure also in having the opportunity of bearing testimony to the great advantages of this Association, and he would mention an interesting fact. One of the recipients of their bounty last year came to him: he was a man whom he had known since he had been in Hadleigh, and had always looked on as a most honest and well-principled individual. When he first knew him he was the occupier of a small portion of Aldham Common, under Mr. Pretty, now of Bury. The poor man fell into difficulties, having had the loss of a horse, and a cow or two, but he managed to pay up what was due except a sovereign. This matter had been forgotten by Mr. Pritty, who had regarded the man as not likely to be able to pay it. Well, the man came to him, as he had stated, and asked him to remit, out of the money he had taken for a prize, the sovereign to Mr. Pritty which he had owed him so many years, and he added that, though Mr. P. was entitled to interest, yet perhaps he would forgive him a portion thereof. He had attended to the request, and had received from Mr. Pritty the following letter:

"*Bury St. Edmunds.*

"Dear Sir,—I am obliged by your communication enclosing 1*l.* from Howes, and am very much pleased with the sterling honesty of his character which it manifests. It had quite escaped my attention that he was indebted to me that sum, though I now remember it; but of course it is so long since the debt was contracted that I could not have enforced the payment of it, so that it was become a debt of honour. It strikes me that the appropriation of the whole or part of the prize which he obtained is so much to his credit that it deserves to be made honourable mention of to the Association that gave him the prize; and as the amount passed through your hands I shall be obliged if you will, at the ensuing yearly meeting of the Society, mention the circumstance, as it appears to be one worthy of commendation."

He thought the members could hardly fail to be pleased that a prize had been awarded to a man of such sterling worth: the circumstance certainly showed a degree of honour and honesty rarely to be met with in the higher classes. He thought while they were enabled by their small contributions to reward such deserving characters, they would be happy to continue their subscriptions.

Mr. Thos. Hawkins proposed the health of Mr. Daking, and the successful competitors. He knew no one who had received more prizes that day, or brought a better lot of sheep into the yard, than Mr. Daking had done. They must all feel gratified at the way in which the Judges had awarded the prizes, though he certainly could not agree with his friend Mr. Crosse that the day was much too cold for them to examine the sheep. He thought if they judged by the eye rather than by the touch, they would make but a poor hand of it. Whether a sheep were shorn a month or only two or three hours before, a person could tell where the bones were, without trusting much to the eye in that particular.

Mr. Daking returned thanks, and congratulated the members on the success of the association, which he considered did a great deal of good.

Mr. Crosse explained that the Judges did handle the sheep, and his remarks had reference only to the appearance they presented. He believed they did not judge a single animal without touching him.

Mr. Postans proposed the health of the senior member of the association—Mr. Robert Partridge, sen., who acknowledged the compliment.

Mr. J. Everett proposed the health of Mr.

Barker, the very excellent Chairman of the Ramsey Farmers' Club (cheers).

Mr. Barker returned thanks. He had enjoyed very much the excellent exhibition of stock in the cattle yard, and he had been greatly pleased with the remarks made to the meeting, and more particularly with the anecdote narrated by Mr. Clayden. He believed that in the labouring class there was more sterling honesty and worth than in any other class in the kingdom; and when he looked at the comforts those above them enjoyed through the instrumentality of that class, he felt too much could not be done to promote ther comfort and well-being. Mr. Baker had told the farmers that they should rear their own stock, and that they purchased their animals for fattening at too dear a rate. For some time he (Mr. Barker) had reared his own stock, beginning with the calf and ending with the bullock, beginning with the lamb and ending with the fat sheep. As his was not a stock farm, he was obliged, of course, to resort to many expedients. At this time of the year he had generally about a hundred head of young stock; but although this was a very good principle to adopt, he thought that if Mr. Baker had pursued it he would find that, if the profits were nothing on cattle purchased, they were very small indeed on those which the farmer reared (Hear, hear). He knew that a great many dodges were put forth as panaceas for the depression of agriculture, such as high farming, increased machinery, drainage, &c.; but he would observe that all these things must be dependent upon circumstances, upon the character of the occupation, and so forth. From draining he himself had received no benefit. All these principles, applied singly, under favourable circumstances, were very advantageous; but they were not of general benefit. If Mr. Baker's system were generally adopted, meat would become so low in price that the object would be defeated. If all were to rear their own cattle, the quantity of meat would be so large that the profits would be smaller than now. In reference to the observations of the chairman as to the abstraction of capital from the soil, he was convinced that one of the evils we laboured under was that abstraction of capital—we had laboured under it for the last five years, and should do so still. He maintained that the country had not the capital employed in the soil to produce so much corn as was produced five years ago, by one-fourth; and he believed that Sir Fitzroy Kelly was right at a late election, when he made a statement respecting the reduction of the quantity of corn grown within the limits of this kingdom. He (Mr. Barker) fully believed that the production of corn in this county was not equal to what it was six years ago—adverse seasons and other circumstances had reduced the quantity grown to more than the amount of our importations. It might be asked then why there were such low prices? He would reply that all speculation was paralyzed, and no one would purchase corn except from hand to mouth, which made low prices; and while the ports were open they must expect low prices, and the consequences must ultimately exhibit themselves. He was convinced that in the county of Essex the farmers did not grow so much corn by a quarter per acre as they did six years ago. He himself had taken some pains to instil a spirit of improvement among his brother farmers, but he must say they wanted something practical—they wanted remuneration. It was all very well to say "Cultivate, cultivate!" but he would say "Remunerate, remunerate!" that there might be a better return for the outlay of capital than there had lately been (cheers).

Mr. Baker said it was a question, having a given quantity of food, how it was best to apply it to advantage. He contended that if it were applied to the rearing of young stock and keeping them to fatten, it would be better than the purchasing of stock for grazing purposes. There was another advantage which he did not mention. To purchase first-class stock for the purpose of grazing required a large capital; to stock a farm with young stock required a small amount of capital; therefore it would be found that the profits were larger in that point of view than in stock purchased to graze. As far as he had seen and heard, the breeder had the best end of the stick; the man who reared sheep or animals and sold them to his neighbours got more than the man who fattened; then let the farmer rear his own cattle, and if the profit were more at one end than the other, let him have it.

Mr. Barker agreed with Mr. Baker that the best application of the food of a farm was in the rearing and fattening of stock; but he thought also that if they reared and fattened to a very great extent they could not do so without remuneration, and that the system would not relieve them from the depression under which they laboured.

The Chairman proposed the health of Mr. Bale, of Harling.

Mr. Bale, in returning thanks, said he believed that the slow progress agriculture had hitherto made as a science was to be attributed to a want of education on the part of the cultivators of the soil, and to ignorance of the connection between agriculture and chemistry; but a new and brighter period was dawning; the farmers were beginning to know that they need be scholars to follow the plough. When they saw landlords and stewards providing such inadequate farm buildings, and letting farms without any security of tenure, not even allowing the tenants to think for themselves as to the best mode of cultiva-

ting their farms, binding them down to obsolete systems of cropping for every description of soil, it was time they should be sent to college to learn the why and the wherefore. (Cheers.) There was no question that science applied to agriculture under proper regulations would promote the interests of agriculture; science would be the polar star, and practice would carry it through. These two sorts of knowledge—science and practice—required two orders of mind, but excellent practical farmers would not dispute the principles upon which practice was founded. He was glad to say that many farmers were arousing from the sleep in which they had been so long slumbering, and in which many of their brethren were reposing, and were rubbing their eyes and waking up to a sense of their position; but there were many practical farmers who understood effects but did not understand causes; they could tell that on some lands clay would produce effect, and on others none; that white crop after white crop should not be introduced; that land would become sick of clover, and so forth. But few were aware of the causes which produced these effects, and they might be sure that, unless they knew something of causes, they would work at a disadvantage. Farmers should know something of the soil they cultivated; and earth air, and water being the agents with which they worked, geology and chemistry should be understood by them. Mathematical analysis had done much for astronomy; and in like manner chemical analysis would be beneficial, for it would enable the farmer to put into the land what was necessary to produce any crop he pleased, even to the growing of turnips and potatoes; it told them there was no soil so barren, no rock so steep, but that the sinews of our noble labourers could render it productive and capable of sustaining life; and that that which used to embarras and perplex would vanish as soon as science and chemical skill were put to it—that the barren heath, the indigenous clay, and the bog, might be wrought to become rich and fertile for the benefit of man.

Mr. GRIMWADE proposed the healths of the professional gentlemen of Hadleigh.—Mr. GROWSE, Mr. ROBINSON, and Mr. LAST severally returned thanks.

Mr. BARKER proposed the healths of the Committee, and Mr. PARTRIDGE acknowledged the toast.

Mr. CLAYDEN proposed the health of Mr. Strutt, with thanks to him for the use of his meadow. Mr. STRUTT returned thanks.

Mr. LAST proposed "Success to Agriculture," coupling with the toast the name of Mr. Caleb Kersey. (Cheers.)

Mr. C. KERSEY, in returning thanks, said, in reference to the remarks of Mr. Bale, that he was rather doubtful whether chemistry could do much good for the farmers. He thought there must be a good deal of the old system as well as of the new to ensure prosperity through an increased quantity of corn. He was one who thought that land could not be made to produce more than a certain quantity. He had observed that the application of some artificial manures would in the spring time have such an effect on the blade as to lead him to look for a most luxuriant crop; but he had noticed that, at harvest, there was not more corn in consequence of the application, and in some cases not so much. (Hear, hear!) He did not mean to say this applied to all artificial manures: still he thought, from all he had heard, and especially from what he had seen done by a gentleman whose name he need not mention, but who had met them at some of their annual musters, and whose balance-sheet he needed not go into—(laughter)—that they ought to be very guarded indeed in the expenditure of their money in this shape. (Cheers.) There must be a cautious selection of those artificial manures, and the use of all advisable means to ensure as far as possible good crops. But, after all, in this country they were subject to such fluctuations of seasons that what would answer perfectly well at one time would not at another, when, if they had not put the expense into the land, the crop would have been better. He did not think there could be laid down any unerring system, either for rearing stock or for the management of a farm. They must farm on their own judgment as far as they could, with the assistance of the advice of their neighbours, and especially such as they heard from time to time offered them at the monthly meetings of the Hadleigh Farmers' Club.

The Rev. J. Y. COOKE proposed the toast of "Trade in general" coupled with the name of Mr. Cook, who acknowledged the toast.

Mr. ROBINSON proposed the healths of "the Labouring Classes."

The HIGH SHERIFF gave "The Press," coupling therewith the name of Mr. Horace Barker, of the *Bury Post*, who returned thanks.

Mr. EVERETT proposed the healths of "the Judges of the Ploughing." Mr. FIDGETT acknowledged the toast, and in high terms, as a practical ploughman himself, commended the execution of the work, and expressed his opinion that in the ploughing department the district round Hadleigh could not be beaten in the whole world.

"The health of Mrs. Knox and the Ladies of Hadleigh," was next given, and acknowledged by the Rev. H. B. Knox, who took occasion to pay some graceful compliments to the excellent lady of the worthy Chairman; and after this the meeting broke up.—Norwich and Bury Post.

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weath.
Day.	8 a.m.	10p.m.	Min.	Max.	10p.m	Direction.	Force.	8 a.m.	2 p.m.	10p.m.	
	in. cts.	in cts.									
May 24	30.02	29.97	45	61	55	Easterly	lively	cloudy	fine	cloudy	dry
25	29.97	29.87	50	59	52	N. East	lively	cloudy	cloudy	cloudy	dry
26	29.80	29.84	48	52	50	E.N.E.	lively	cloudy	cloudy	cloudy	rain
27	29.89	29.87	48	53	47	North	gentle	cloudy	cloudy	cloudy	rain
28	29.78	29.78	46	56	52	E. by N.N.E.	gentle	cloudy	cloudy	cloudy	rain
29	29.72	29.63	45	50	43	E. by North	gentle	cloudy	cloudy	fine	rain
30	29.65	29.73	35	56	45	Eastly. W. by S.	gentle	fine	cloudy	cloudy	dry
31	29.83	29.83	41	57	46	W. by South	gentle	fine	fine	fine	dry
June 1	29.83	29.88	41	64	49	S. West	lively	fine	fine	fine	rain
2	29.91	29.83	49	61	51	S.S.W.	brk.stg	fine	cloudy	fine	rain
3	29.77	29.93	48	57	47	S.S.W.	gentle	cloudy	cloudy	cloudy	rain
4	29.76	29.68	44	64	49	S.W., West	lively	cloudy	fine	fine	rain
5	29.97	29 93	45	69	56	S. by East	var.	fine	sun	cloudy	rain
6	29.88	29.73	54	69	58	S. West	gentle	cloudy	sun	fine	rain
7	29.69	29.58	57	63	53	S.E., var.	gentle	cloudy	cloudy	cloudy	rain
8	29.60	29.62	52	65	55	S.E., S.W.	var.cal.	cloudy	cl udy	hazy	rain
9	29.61	29.55	54	61	56	S. Westerly	gentle	cloudy	cloudy	cloudy	rain
10	29.55	39.55	53	57	46	N.W., S.W.	gentle	cloudy	cloudy	cloudy	rain
11	29.52	29.58	43	61	47	W. by North	lively	cloudy	cloudy	fine	rain
12	29.64	29.72	42	59	50	Westerly	gentle	cloudy	cloudy	cloudy	rain
13	29.73	29.52	45	59	49	S. West	var.bk.	cloudy	cloudy	cloudy	rain
14	29.28	29.32	47	63	50	S.W., Wly. by N	var.	cloudy	cloudy	cloudy	rain
15	29.46	29.58	47	64	51	Westerly	var.	cloudy	cloudy	cloudy	rain
16	29.40	29.44	48	64	53	S. West	lively	cloudy	fine	cloudy	rain
17	29.44	29.50	50	65	52	S.S.W.	lively	cloudy	fine	cloudy	rain
18	29.54	29.58	48	64	52	South	lively	cloudy	fine	cloudy	rain
19	29.59	29.71	51	66	55	W. by S.W.	lively	cloudy	fine	fine	rain
20	29.80	29.75	50	69	55	S.W., South	gentle	cloudy	fine	cloudy	rain
21	29.64	29.64	54	66	53	S. West	brisk	cloudy	sun	fine	dry

ESTIMATED AVERAGES OF JUNE.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.46	29.60	90	37	58.7

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
61.17	47.60	54.38

Weather and Phenomena.

May 24—Some sun; fine p.m. till 7 o'clock. 25—Fresh wind. 26—Cold day; wet evening. 27, 28—Overcast; drizzle. 29—Much small rain. 30—Fine; superb golden sunset; black illuminated clouds. 31—Fine.

Lunation.—First quarter, 26th day, 3 h. 38 m. afternoon.

June 1—Heavy clouds. 2—Pretty fine; cirrus. 3—Very rainy. 4—Fine: a few drops. 5—Fine, warm, and airy; cirro-stratus modification. 6—Fine growing temperature. 7—Wet day; rain set in. 8—Fair morning, rainy afternoon. 9—Profusely rainy. 10—Same, till 4 p.m. 11—Changeable; wet noon; fine evening. 12—Dark, cold morning. 13—Changeable; rainy evening. 14—One clap of thunder, several showers. 15—Fine morning and evening; showery mid-day. 16—Windy and rainy forenoon. 17—Some hours fine; evening showery, with wind. 18—Showery and changeable; wind at sunset. 19—Showers; gleams; three rolls of distant thunder at 3, wind veering with it; fine; clearing. 20—Fine genial noon; changeable and wet afternoon. 21—Windy; gleams; finer; no rain.

Lunations.—Full moon, 2nd day, 6 h. 26 m. morning. Last quarter, 9th day, 3 h. 15 m. afternoon. New moon, 17th day, 4 h. 47 m. afternoon.

N.B. In cases of doubt, the degrees of temperature are compared with those of other readings off.

REMARKS REFERRING TO AGRICULTURE.

So long a period of thorough wet weather is not within our recollection since 1799—25 days, with scarcely an exception, since the 26th of May! True it is that many weeks of drought during the spring preceded this deluge, and thus a compensation has been made. The crops, and indeed vegetation of every sort, progress astonishingly, and are superlatively luxuriant. Wheat was seen—partially—in ear ten days since—so was barley; still we must consider the season as *late;* and much depends upon a powerful sun and a tranquil atmosphere. The first crop of mixed grasses I saw in heavy swarth about the 19th.

J. TOWERS.

Croydon.

CALENDAR OF HORTICULTURE.

PLANT HOUSES.

Conservatory.—In addition to the general syringings in this house, which are so necessary for the health and cleanliness of the plants, it will be found of great benefit to go over such things as Camellias, Oranges, Ficus elastica, Rhododendrons, and other thick-leaved plants, and wash off with a sponge and water the impurities arising from dust and other causes, which are sure to become encrusted on the leaves. It is astonishing how this will improve them both in health and general appearance. A continuance of such weather as we have lately experienced will be a good time to attend to these things. Let the operator be instructed to be careful of the young growth, as it will not bear washing at this time. Attend constantly to the necessary fumigations for the destruction of insects, which appear this year to be more than usually numerous; and the best directions as well as the best exertions are entirely nugatory if their destruction is not attended to in every department of plant-growing.

Greenhouse.—As the early Pelargoniums go out of flower, let them be placed out of doors on coal ashes, in a sheltered place, but exposed to the sun, in order to ripen and mature the wood. Calceolarias are now going out of flower, and as they become unsightly, should be removed to a situation under a north wall. Unless required for seed, let the flower stems be removed immediately, and be very careful that they do not become saturated with water. This remark will apply to all plants now standing out of doors in pots, as irreparable injury is often done for want of attention to this. The best plan is to turn on their side all those most likely to suffer, but by all means endeavour to give the choicest and best plants the protection of a cold pit, under glass. Balsams and other conservatory annuals should now be advancing into bloom to take the place of the calceolarias. Fuchsias also will now be coming in very useful, and must be kept neatly trained out, and encouraged to bloom fine. Too much pot-room is not desirable, as if the roots are rather cramped than otherwise, it will induce a flowering habit; and occasional supplies of liquid manure will keep the blooms well up in size and brilliancy of colour. See that the plants of Campanula pyramidalis are not suffering for want of pot-room and nourishment—they will be invaluable in a month or so. Put in cuttings of the same, or young offsets, for another season's blooming. Train out the branches of the Coral Tree, Erythrina crista galli, and let them have free exposure in fine weather, but shelter from drenching rains. Scarlet Geraniums, Petunias, Tropæolum Lobbianum, &c., for late blooming, should have a final shift, and be kept growing freely. Keep them in a cold pit near the glass, with a very free circulation of air. See that the potted Chrysanthemum cuttings get a very free circulation of air, and dust them with sulphur. If this cloudy, sunless weather should bring on mildew, keep them also well stopped for the next three weeks, after which it is not safe to do so.

FORCING HOUSES.

The last three weeks have been very unfavourable for operations in this department. In the Pineries, if this weather continue, be careful of using too much water, and also to moderate the fire heat, for too much stimulation, under such unfavourable circumstances, will cause a weakly, elongated growth; but if bright and powerful sun should come on, let them have full advantage of it; still, for a few days it may be necessary to apply a slight shading during the period of its greatest power, say from 12 to 3 o'clock. The cold, sunless weather has had a bad effect on grapes about colouring. The interior should be kept dry, and a temperature ranging about 75 deg. kept up, so as to allow of a free circulation of air. Later houses, with the fruit swelling off, must have less water thrown about the house, until more favourable weather. Look out for mildew, which is not unlikely to be induced by such a long continuance of dull, damp days, and dust with sulphur, as soon as perceived; if it appears on a large scale, by all means use Epps' large sulphurator, one of which should be kept in every garden, as it is useful for the application of sulphur to more than mildewed vines; for peaches and other trees on walls it is most excellent, also for roses.

FLOWER GARDEN.

The lamentations with regard to the continued rain and absence of sun are nowhere more severely felt than in this department, as it is next to impossible to maintain a thorough neatness. Weeds are springing up by thousands, and the ground cannot be effectually moved to destroy them. However, no exertions must be spared when the ground is dry to keep the surface soil in the borders generally, as well as amongst the bedded-out plants, very often stirred about. At present budding plants have made very poor progress—a week or two of warm sunny weather will be quite necessary before we can expect much display from them. Keep them nicely

trained out and pegged down, to guard against high winds. In the herbaceous garden a great amount of labour will be necessary to keep all neat. The foliage of the bulbous kinds must be removed as it decays, and if any large vacancies are produced, they may be filled up with Asters, African and French Marigolds, Zinnias, and also with some of the spare bedding-plants, such as Cupheas, dwarf Scarlet Geraniums, Heliotropes, Verbenas; take care also to distribute plenty of the different varieties of Salvias all through the mixed flower garden; they will make a glorious display in the autumn. Look out for cuttings of the choice varieties of herbaceous Phlox, as the present is a good time for putting them in. Take care that roses are properly secured from the winds, and that they are not overloaded with wood; thin out the blooms of such as are required extra fine. Budding may be commenced immediately on such stocks as have acquired sufficient consistency to bear the knife.

Kitchen Garden.

Let there be no delay in getting in the main crops of Celery immediately, and plant a row of Bath Cos or other sorts of Lettuce down the middle, between each row of celery—they will be off long before the celery will require earthing up. Strew salt over Sea Kale and Asparagus beds in wet weather, so that the rain may carry the salt down to the roots. Plant out successional crops of Cape Broccoli, Cauliflower; also, for later crops of winter greens of all sorts. See also that a sufficient stock of hardy Broccolis for spring use are planted out. Plant a good breadth of Cabbage for autumn use; and in dry weather keep the ground well stirred amongst advancing crops of all descriptions. Keep up successional sowings of Lettuces, Radishes, Salading, Turnips, and Spinach. Make a sowing of green and white curled and Batavian Endive. Keep Tomatoes well nailed up, as they are very liable to be injured by the wind.—C.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JUNE.

During the first three weeks of this month an unusually large quantity of rain fell in all parts of England, and, at one period, fears were entertained lest considerable damage would be sustained by the growing crops. It is, however, highly gratifying for us to observe that an important change has latterly taken place in the weather, and that our advices from nearly all quarters in reference to the general appearance of the wheat, as well as spring corn, are very favourable. It is evident, however, that the heavy lands were so completely saturated with wet that some time must elapse ere they completely recover themselves; but light soils have unquestionably derived great benefit from superabundant moisture. Prior to the rains commencing, the land was, in many instances, almost bare of grass, whilst the grain and potato crops had a most unpromising appearance. But a very speedy change took place about the 15th, since which date vegetation in general has progressed at a very rapid rate. In our forward counties wheat is now in blossom, hence we have arrived at what may be termed the most critical period of its growth. Heavy rains, accompanied with strong gales of wind, would have a most prejudicial effect upon the plant. As yet, however, nothing has transpired to warrant the belief that the total yield will in any way prove deficient. As regards barley, oats, beans, and peas, we may observe that they give promise of a large return, although it is stated that in some quarters beans are suffering from blight.

As yet, the supplies of new potatoes disposed of in the metropolitan and provincial markets have been small, yet their general quality has proved remarkably good. They are now steadily increasing in size, under the influence of a warm temperature. The return of cold and wet weather might prove very injurious to the whole crop. At present, no signs of disease have presented themselves. From the immense consumption during the last six months, and the limited nature of the imports from abroad, we may safely conclude that last year's crop was unusually large. The present one promises to be equally extensive. The stock now left is very small, and the value of it somewhat difficult to understand; indeed, for some time past sales have been made at very irregular quotations. An import of about 100 tons of new has taken place from the continent, and we learn that immense quantities are about to follow.

In the neighbourhood of the metropolis, haymaking has been commenced; but the return of damp weather on the 25th has put a stop to cutting. We perceive that the grass on most good lands has become "full-bottomed;" hence, should we be favoured with a fine dry atmosphere during the first fortnight or three weeks of July, a large crop will be secured in good order. The late period at which operations have been commenced render it very doubtful whether the second-cut will be worth the expense of cutting. The demand for both hay and straw—owing to the large quantities of green food—has been by no means active; nevertheless, prices have slightly advanced.

Notwithstanding the difficulties experienced by parties in Australia to obtain a sufficient number of hands to man their homeward-bound vessels, the arrivals of wool from the colonies have exceeded 38,000 bales, making the total stock in London about 50,000, the whole of which will be submitted

to public competition in a few weeks. It must be satisfactory to the dealers to learn that the above supplies have come to hand in excellent condition, and that they exhibit no traces of the want of adequate labour. The continuous advance in the value of colonial wool has, of course, had considerable influence upon the holders of English qualities. Up to the present time, the rise in the quotations has been from 0½d. to 1d. per lb.; but our impression is, looking to the great demand for shipment to the continent, the great activity in our manufacturing districts, and the rapid increase in our export trade, higher rates will rule as the season progresses, although this year's clip has been a large one.

The demand for guano has now become very inactive, but we may observe that nearly or quite the whole of the season's import has found buyers, for home use and shipment to the continent. We are glad to perceive that efforts have been made to destroy the monopoly in this article, but we are not satisfied that the right course has been adopted. Lord Derby has asserted that the Lobos Islands belong properly to Peru; but, assuming that such is the case, we would have a direct communication opened with the Peruvian government itself; we would have the agriculturists "take a leaf" out of the books of the gentlemen in Capel Court, and there would be no difficulty in proving to that government that competition in the article would be beneficial to the interests of Peru.

The stocks of home-grown wheats in the hands of our farmers are now much reduced, whilst those of all spring corn are unusually small. In the general features of the corn trade very little change has taken place; yet prices have somewhat hardened, from the fact that the supplies of foreign produce in our warehouses are smaller than for a series of years past. This circumstance, however, has in no way induced speculation, dealers in general being indisposed to increase their stocks with the prospect of steady arrivals from abroad. Most of the advices from the continental ports are to the effect that the trade has continued in a very inactive state.

In Ireland and Scotland a very limited business has been doing in most kinds of grain, the prices of which have been with difficulty supported. The shipments of grain to England have been on a very moderate scale.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the supplies of beasts on offer in Smithfield in the month just concluded have been seasonably extensive, and, for the most part, in full average condition, the demand for that description of stock has ruled somewhat active, and prices have advanced fully 4d. per 8lbs. This improvement is, in some measure, attributed to the rapid rise in the value of barrel provisions for the Australian shipping, and the great scarcity of salted pork, not only in London, but likewise at the outports. The numbers of sheep have exhibited a considerable falling off, compared with those at the corresponding period in 1851; but their general weight has been good. On the whole the lamb trade has continued in a very inactive state; whilst calves and pigs have not varied much in value.

Our advices from the whole of the grazing districts are very favourable as regards the health of the stock. The supply of dry food has become very limited, but this is now a matter of little moment, as the pastures show unmistakable signs of the beneficial effects of the late seasonable rains. The various fairs have been fairly supplied with both beasts and sheep, for which the inquiry has ruled steady, at fair quotations.

On the whole, the imports of foreign stock have been good; but we have observed very little improvement in quality. Those into London have been as under:—

	Head.
Beasts	2,035
Sheep	9,784
Lambs	965
Calves	2,145
Pigs	227

IMPORTS AT CORRESPONDING PERIODS.

	June, 1847.	June, 1848.	June, 1849.	June, 1850.	June. 1851.
Beasts..	4,594	2,044	1,300	1,515	1,413
Sheep ..	29,430	9,591	7,631	7,398	7,987
Lambs..	995	74	386	302	593
Calves..	844	1,692	1,459	1,600	1,331
Pigs ..	—	—	2	125	65,1

The total supplies exhibited in Smithfield have consisted of:—

	Head.
Beasts	18,209
Cows	531
Sheep and lambs	134,160
Calves	2,781
Pigs	2,820

SUPPLIES AT CORRESPONDING PERIODS.

	June. 1847.	June, 1848.	June, 1849.	June, 1850.	June, 1851.
Beasts ..	16,222	17,452	15,899	16,608	17,805
Sheep and lambs .	148,660	152,730	153,320	182,620	169,420
Calves ..	3,064	3,846	2,667	2,453	2,275
Pigs....	2,488	2,641	2,322	2,475	2,611

Since our last, the arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire have amounted to 8,000 head, against 9,900 do. in 1851; 2,450 from other parts of England, against 2,200 in 1851; and 2,350 from Scotland, against 2,300 in 1851. We may observe that, owing to increasing compe-

tition, numbers of beasts are now shipped at Aberdeen to Newcastle, and thence forwarded to London per railway. The saving by this mode of conveyance is estimated at 2s. per head.

Newgate and Leadenhall markets have continued to be well supplied with each kind of meat, yet the trade has ruled steady, and prices have had an upward tendency. Beef has sold at from 2s. 6d. to 3s. 6d.; mutton, 2s. 8d. to 3s. 10d.; lamb, 3s. 10d. to 4s. 10d.; veal, 3s. to 3s. 10d.; pork, 2s. 6d. to 3s. 8d. per 8lbs. by the carcass.

SOMERSETSHIRE.

After an unusually dry spring, we have almost an extreme wet summer, as far as it has gone. The wheat has stood the excess of wet well as to its standing up, and the late dry weather appears to have stiffened the straw. The early pieces have been some time in ear, and the blossom has pared off, though it is unpropitious weather for its kerning, and the quantity here will no doubt be lessened: the ears are fine, and the wheat is thick on the ground, and should it take up fine the later wheat will be a large crop. Among the beans there is an extensive blight, which will no doubt, as regards the winter ones, much lessen the crop; it is so bad in some instances that they are not worth standing. The vetch crop is more extensively injured, and there appears likely to be but few worth preserving for seed. Spring beans are now in blossom, and may escape the blight which has attacked the winter ones: if not they are likely to suffer more. Oats have come up nicely. It has been too wet for some of the early pieces of barley, as they are laid by the heavy rain. We have altogether a good plant of mangold-wurtzel, and the swedes are well come up; the sowing has been retarded by the wet. The flax sown this year will be enough in quantity, but rather coarse. Some of the artificial grass has been cut and spoiled in making, and others have been over ripe. These few fine days have encouraged the commencing on a more extensive scale. The crop appears thin, but have grown up high, and will be quite an average. There is also a very fair appearance of hay in the meadow land, but very backward, and we are likely, with all our harvest, to be beyond the average period. Potatoes have grown in haulm, but they have not grown in the tubers, and are watery; there has been some mention of the blight, but cannot tell to a certainty. We have had an improved demand for meat, which has advanced fully ½d. to 1d. per lb., with a very good clearance. Beef, 8s. to 8s. 6d.; mutton, 6d., out of their coats; the best lamb, 7d. Poor stock, but more especially sheep, have sold at higher prices, and are relatively higher than last year. Wheat has advanced from 5s. to 5s. 3d., red 5s. 6d., and white 5s. 6d. to 5s. 9d., the best is held for 6s. Flour, 30s. to 32s. Beans, 4s. to 4s. 3d., and new 4s. 6d. No barley offering. Oats, 2s. 9d. to 3s. per bushel. Short supply of wheat, and very good sale for flour. Very little done in wool, prices 1s. to 1s. 2d.; no briskness in the trade, the holders are looking higher than dealers like to venture on.

LEICESTERSHIRE.

The operations of the husbandman depend so greatly upon atmospheric influences that his exertions are frequently marred from the adverse state of the weather. The public are not apt to receive this as any apology for farmers when they are disposed to grumble at the dispensations of Providence in this respect, or to attribute the failure of his crops from the same cause. The present year has been one of great trial to those engaged in the cultivation of the soil, and we only hope that the future of this season may prove a contrast to what they have at present experienced. Long intervals of dry weather in our climate, uncertain though it be, are frequently followed by continued rain; such is the case at the present time, and we have great reason to be thankful for this seasonable supply of moisture. We have had nearly as much rain fallen within the last seven days as in the months of March, April, and May: in those months we registered 1.67 inches, and in the week ending to-day 1.25 inches. The effect of the long drought upon vegetation was baneful in the highest degree, especially to pasture land, for, whether it was laid for mowing or grazed, the ungenial and dry spring checked its progress to that degree, and to such a late period, that no subsequent weather can bring the crops up to an average state of productiveness. Those which have been lightly stocked since the commencement of the rainy season have greatly improved, but where a full amount of stock has been kept, they are still very deficient; and even on the best feeding land great complaints are made to the same effect. The graziers say that their beast were never known in such a backward state at this season of the year, and, from the present state of their pastures, they intimate that the supply of beef from our grazing district will be very light for some time to come. The state of our weekly markets exemplify this, for we never recollect so few of our home-fed beast exhibited as at the present time; on some market days not half-a-score of these can be found, and the chief supply is brought by jobbers from a distance. In consequence of this deficiency, beef has advanced full ½d. per lb., and superior qualities rather more, which is now worth 5½d. per lb., but the great bulk of stock is sold at 5d. We have been fully supplied with mutton, a large number of fat sheep arriving every week from Lincolnshire, but from our own pastures the supply is not large. The price may be quoted the same as beef. The condition of store stock is below its usual state, as they have been severely punished in the spring, and, though the pastures have greatly improved, they do not thrive so well as could be wished from the continued rain. We regret to remark that there are more symptoms of disease amongst our herds than for some time past, though we do not hear of many *pleuro pneumonia* cases, but it is the complaint which effects the feet and mouth, and it is proved, beyond all doubt, that those which have once had it are not free from a second attack. The consequences of the long drought will be felt more severely in the next winter, for such mischief has been done, both to clover and grass crops, that, under any circumstances, they will be exceedingly light; and we cannot estimate the amount of fodder for the next winter at more than one-half the quantity of last year's growth. Many crops of clover and rye-grass, though very light, have arrived at

maturity and require cutting; in fact, they would have been gathered in by this time had the weather permitted, but no one will venture to mow his seeds while the present showery weather continues, and we have only seen one small patch or two cut within the last two days, which have been rather finer. A sunless June is a very bad time for haymaking, and is not an ordinary occurrence in our variable clime, yet such has in a great measure been the case, as we find that the average amount of clouds for the day has been in the proportion of seven out of ten. We have great pleasure in reporting that the drought has not had that injurious tendency as regards the corn crops compared with those of grass. We believe the early sown barley will in the end be the worst; it received so severe a check, and of such long continuance, that it began to shine into ear prematurely, and, in many instances, will be a thin and short crop. The latter sown, nay, even the latest, which lay a long time before making its appearance, has of late made extraordinary progress, and looks very flourishing, and, we believe, will come to an average, when at one time a very low estimate was formed of its ultimate yield. The same remark will in some respects apply to oats; but we do not think, under the adverse circumstances of a long drought, and then constant rain for three weeks, either of these crops will yield an average produce. Beans are short in the straw at present, and the winter variety went into bloom prematurely; the spring sown have blossomed where very short, but with fine growing weather there is yet time for both to make great progress. The most gratifying portion of our report will be with reference to the wheat crop, which is of the greatest importance to the inhabitants of this country. A deficient supply or an inferior quality of bread is one of the greatest calamities which can befall them, and, notwithstanding the adverse season, the wheats generally present a promising appearance. This plant, though a hardy one, is, like all others, though in a less degree than most, subject to atmospheric influences, less so in its early stages, being sown in autumn, than when approaching its maturer age; thus we find it has progressed through the drought rather slowly, but the fine rains we have lately had have stimulated it in a high degree. Though in some situations the effects of the drought will be visible when the crop falls before the reaping machine or the sickle, and will not give a great bulk; still, generally speaking, this will only be the exception to the rule. The early sown is now coming well into ear, but there will be a considerable difference between this and the late sown as to the time of cutting, and we expect upon the whole that the harvest will be rather late. As regards this much depends upon the weather, but, were we to hazard an opinion, we have great fears in respect to the next two months; after four such comparatively dry months as February, March, April, and May, we expect much rain in July and August. We hope we may be wrong. The culture of land for green vegetable crops was, from the dry spring, in a forward state, and the planting of cabbage and potatoes, and the sowing of mangold and carrots commenced in good time. From the lack of rain the two latter lay in the ground a very long time before they made their appearance, in fact only in some moist favourable spots did they sprout at all till the rain came. The cabbage required repeated watering to keep them alive, and the potatoes grew slowly—all these have made much progress during the last four weeks, and are now growing rapidly. It is not the custom in this county to sow Swede turnips generally till the middle of June, though on the stronger soils about the last week in May is the time to commence. We have seen some sown at this time and the first week in June which came up well, and we have not heard any complaint of fly. On the light turnip soils very little had been done, as the rains for the last ten days prevented any extensive sowing; however, in this week sowing has begun in good earnest, and during the last three days a great breadth has been put in with every prospect of speedy growth, the land being generally well cleansed from filth during the dry weather, and is now in the best possible state to receive the seed. The weather has not been favourable for getting the sheep shorn, and the wool is liable to be in a damp state where caution is not used, but we believe it is of good quality, generally speaking. The hopes of our flockmasters are raised, as regards the price they are likely to obtain for their wool. Little has been sold at present, but as the stocks of old wool are light, both in the hands of the growers and the staplers, a brisk demand is anticipated, and great competition to purchase is expected at our wool fair, which is fixed for the 30th instant, at Leicester. No doubt there will be a good demand, and the price, in consequence of what we before mentioned, combined with the hazardous state of the flocks in Australia, will bring our wool into greater request, and we think it will be the fault of the sellers if a considerable advance upon the prices of last year is not realized. We have heard of 32s. per tod being offered, but we suspect the lot to be a superior one; however, sellers have nothing to do but to ask a good price, and be firm, and there is no doubt but they will obtain it. We have had more labourers out of employment these last two months than for some time past, but this in a great measure has been owing to the late and ungenial spring. Wages range from 9s. to 12s. per week, according to merit.—June 23rd.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF JUNE.

When we last addressed our readers the appearance of the growing grain crops was such as to afford grounds to anticipate more than usual abundance; but the weather has since been of a character to render it doubtful whether the early promise will be realized. Up to the present period no actual mischief of consequence has perhaps been done by the great quantity of rain which fell the first three weeks in the month, in all parts of the kingdom; still this, and the absence of sunshine, have certainly given rise to uneasiness respecting the ultimate result of the harvest.

The wheat plant, notwithstanding the drought in February, March, and April, grew very rapidly during the spring; the showers and increased warmth experienced in May further stimulated its

growth, and it became somewhat rankly luxuriant. The subsequent heavy rains in June were, therefore, far from favourable, and in some localities the plant has been partially beaten down; with an interval of dry weather it would probably regain an upright position, but a recurrence of wet would be attended with great danger. The spring-sown crops are not so readily injured by rain as wheat, and we are inclined to think that all kinds of Lent corn would give a good return if the remainder of the summer should prove tolerably propitious. We are unable, however, to give the same opinion in regard to the autumn-planted beans: up to blooming time all appeared to be promising; but, from some cause or other, the blossom has dropped off without setting, and we fear that large breadths will have to be ploughed up as wholly unproductive. This failure we are disposed to attribute to the long continued drought in spring. Tares are said to have suffered severely from blight; and the reports respecting the potato crop are not so encouraging as could be desired. The hay harvest meanwhile stands in some jeopardy; even in the immediate neighbourhood of London cutting has hardly yet been commenced, and unless the weather should prove dry and hot for some weeks, great difficulty will be experienced in securing this crop in anything like good order. The prospects for the farmer cannot, therefore, be regarded as very encouraging. We trust, however, that the fears entertained may be soon dissipated; for a bad harvest and free trade prices would seal the doom of the British agriculturists. The extent to which foreign countries can afford supplies was unquestionably underrated when the corn-laws were repealed. We have repeatedly attempted to show that the effect of admitting the produce of the rest of the world into Great Britain free of duty would be *permanently* to lower prices, and this opinion has been fully borne out by the experience of the last half-dozen years; the only chance, therefore, which our farmers have of competing with the foreign growers is by obtaining the greatest possible quantity from an acre of ground—a deficient harvest would, consequently, prove the severest calamity which could befall them. The shortness of the home produce could not, under existing circumstances, be expected to cause a corresponding increase in value, for so soon as a sufficient rise had taken place to pay the Continental and American growers to ship to this country we should speedily be overwhelmed with supplies. So thoroughly are those best informed satisfied of this fact, that little influence has been produced on the trade by the unsettled, and in some respects unfavourable, weather recently experienced. With comparatively moderate arrivals from abroad, and by no means free deliveries from our growers, supplies have proved sufficient to satisfy the demand, purchasers having in general deemed it prudent to limit their operations to such quantities a s they have required for immediate use. Speculation has been quite paralyzed owing to the almost unusually unfavourable results of the investments which have from time to time been entered into since the trade has been thrown open. A similar position to that in which this country is at present placed would, in former times, have caused a rapid rise in quotations; but doubtful weather, moderate stocks, and last, though not least, abundance of capital, fail to hold out any inducement to meddle with an article in which those who have been sanguine enough to operate have suffered severe losses. How long this may continue to be the case will depend on the season; if nothing further should occur to create uneasiness quotations would probably undergo little variation between this and harvest; but the effect of unfavourable weather would, in the first place, be to cause foreign holders to keep back supplies in hopes of higher prices, and it is, therefore, quite possible that we might have a period of temporary excitement, to be followed by overwhelming importations.

What has lately taken place in regard to oats affords a fair criterion for forming a judgment of what would probably occur in case of a rise in the value of wheat. That the stocks of home-grown oats in the United Kingdom were reduced into an unusually small compass early in spring, in consequence of the extra consumption caused by the shortness of all kinds of green food, is certain; and this naturally led to a rise in prices. It was thought that the near continental ports would not be in a position to afford large supplies, as all the accounts from the other side agreed in stating that the same cause which had operated to produce high rates here had been felt to fully as great an extent there, the drought in spring having been general all over Europe; but what has been the result? No sooner had quotations here risen sufficiently to tempt the foreign shippers, than supplies reached our ports from all quarters, prices were speedily depressed, and the article is now cheaper than it has been at any period for some months past. We are, therefore, inclined to think, if the remainder of the summer should unfortunately prove of a character to lead to serious fears respecting the probable yield of the wheat crop, and prices should in consequence rise 5s. to 8s. per qr. —which they would be very likely to do—that our own growers would derive little benefit from the advance, as the upward movement would, in all probability, be checked by foreign arrivals on a large scale just about the time that the English

farmer might be expected to be in a position to avail himself of the improvement, viz., about or a little after harvest. This view of the future is not very encouraging; but we deem it better to state our unbiassed opinion, however unpalatable, rather than to hold out delusive hopes. Let us trust that the threatened mischief may be averted, and a plentiful harvest give our farmers the only chance which can enable them at all to compete with the continental producer. Latterly the weather has certainly improved; the higher range of temperature which has been experienced since the longest day, and the steady rise in the barometer, are favourable signs. As the future range of prices must depend wholly on the character of the weather, it would be unsafe to enter into predictions; but there is certainly nothing in the present position of affairs to lead to the expectation of a material fall in the value of wheat.

Stocks of barley of home-growth appear to be quite exhausted, and rather an extensive consumption of foreign is now going on for feeding purposes. The supplies from abroad have, however, thus far kept pace with the demand; and as rather large receipts are expected from the Danish islands. &c., we do not calculate on any further advance. Oats have of late come forward freely at several of the ports on the east coast, as well as into London; the bulk of the supply has been from the near ports, and as yet only one or two cargoes have arrived from Russia. The usual supply from thence may now be shortly expected; and it seems doubtful, therefore, whether the value of this grain will recover from the decline caused by the late plentiful receipts.

Beans and peas have advanced rapidly in all parts of the kingdom, owing to the reported failure of the first-named crop, and the somewhat unfavourable aspect of the latter.

Business at Mark Lane has been quiet during the greater part of the month; and though the value of wheat has crept up, the rise has not been either rapid or important. The arrivals of this grain coastwise into the port of London have been moderate, and the show of samples by land-carriage from the neighbouring counties has not been larger than usual at the corresponding period of the year. The offers from the east coast have fallen off, the Lincolnshire and Cambridgeshire farmers having become dissatisfied with the prices current here. The total quantity of English wheat received has, therefore, been rather under than over an average supply; but the millers have conducted their operations with much caution, and nothing like scarcity has been experienced. On the first Monday in the month (7th inst.) the Essex and Kent stands were cleared with some difficulty at the rates current at the close of the preceding month, but since then the demand has gradually improved; on the I4th an advance of about 1s. per qr. was established, and a similar improvement was realized on that day se'nnight. The improvement which has since taken place in the weather has tended to check the upward movement, and sales have during the last few days progressed somewhat slowly at the enhanced terms. Good red Kentish and Essex samples, weighing 63 to 64lbs. per bush., are at present worth 41s. to 42s., and heavier descriptions 1s. to 2s. per qr. more, whilst the finest white would bring 50s. to 52s. per qr. The arrivals of wheat from abroad have not much exceeded 25,000 qrs. during the month, which is less than what frequently reaches us in a single week. The demand has not at any period been active, and importers have been unable to establish any improvement on previous prices. Stocks in granary are, however, becoming very reduced, and a considerable proportion of what remains on hand consists of inferior qualities. There is consequently no reason to suppose that the finer kinds will give way in price, and holders have shown no particular anxiety to realize. The sale of foreign wheat has no doubt been a good deal interfered with by the arrivals of flour, the latter article having been obtainable relatively cheaper than the raw material. During the first fortnight in June a considerable number of wheat-laden vessels arrived from ports east of Gibraltar off the coast. At first sellers were unwilling to make any concession, but finding that buyers were not inclined to pay former terms, they subsequently became more reasonable, on which a fair extent of business ensued; and there are now comparatively few arrived parcels remaining undisposed of. The prices paid have been, for Egyptain 29s. to 30s., Polish Odessa red 33s. 6d. to 34s. 6d., and Ghirka from 37s. up to 39s. per qr., cost, freight, and insurance. Since then the inquiry has rather improved, and purchases could now scarcely be made at the rates named.

The nominal top price of flour has not varied since our last, and quotations of country flour have undergone little change. The demand has been slow for both descriptions, buyers having been deterred from purchasing largely owing to the risk of warm weather affecting the condition. The arrivals from the continent of Europe have not been large, but from America upwards of 40,000 brls. have come to hand. The latter article has met with some little attention both here and at Liverpool, with a view of holding over, and having also had a fair consumptive demand, prices have, notwithstanding the somewhat liberal character of the supply, been tolerably well supported. Good brands have not been parted with below 21s., and fine have been

held at 22s. per brl., and even higher. These rates leave no margin for profit on recent shipments from the United States; still, we may expect further arrivals from thence during the summer.

English barley has come forward very sparingly; but neither maltsters nor distillers buy much at this season of the year, and, trifling as have been the supplies, they have about kept pace with the demand. In the absence of business of the slightest importance, quotations have remained nominally unaltered.

The arrivals of this grain from abroad have proved tolerably good; and though we have had a steady inquiry for grinding qualities, previous rates have scarcely been supported. The fall has been confined to light and ill-conditioned parcels, and has not exceeded 6d. to 1s. per qr.; but the turn has, nevertheless, been rather in favour of the purchaser. At present, barley weighing 48 to 50lbs. per bushel may be bought at 25s. Heavier sorts vary in value from 26s. to 28s. per qr., but the last-named price could only be obtained for very fine weighty samples. The stocks on hand are not particularly large; we are, however, likely to have fair arrivals from abroad, which renders buyers indisposed to purchase more than they consider requisite for immediate use.

The business done in malt during the month has not been by any means extensive; and quite sufficient having been brought forward to supply the requirements of the trade, the tendency of prices has been rather downward, but not so decidedly so as to render it necessary to alter quotations, which we consider much the same as they were at the close of the past month.

The arrivals of oats coastwise have been scanty in the extreme, and the receipts from Ireland (considering that we have had a fortnight of westerly wind) less than might have been expected. The smallness of the home supplies has, however, been more than compensated for by the extent of the receipts from abroad. Up to the 19th inst., nearly 60,000 qrs. of foreign oats arrived at this port; and though the supplies have since fallen off, the quantity now in the port of London is sufficient to satisfy the consumption for some time to come. The pressure on the market at one time was very great. Prices had begun to tend downwards before the close of last month; and from that period up to the 21st inst., a further fall of 1s. 6d. to 2s. per qr. took place, the reduction being greater on secondary and inferior sorts than on good fresh corn; indeed, the latter has suffered comparatively little depreciation in value, owing to its relative scarcity. Of the late arrivals from abroad, scarcely one cargo out of half-a-dozen has come to hand without being more or less heated; and it has been this circumstance which has rendered importers so anxious to realize from on board ship, it being well known that the expense of landing, and the loss of measure which almost invariably attends the process of restoring heated corn to condition, render sales from on board more advantageous, even at comparatively low rates, than a higher price after going to granary. Within the last week or two, the pressure on the market has somewhat abated, but no part of the reduction has yet been recovered. Light foreign feed might still be had at 17s. to 18s., and good corn at 19s. to 20s. per qr. Dutch beans and Polands have been held at 20s. to 20s. 6d., at which rates it has been very difficult to make progress. English and Scotch oats have, in consequence of their scarcity, brought relatively high prices: fair Lincoln feed are still worth 20s. to 21s., and fine Scotch 22s. to 23s. per qr.

The reports of blight in the bean crop, to which we have already alluded, have given rise to an active demand for this article, and the supplies having been short of English as well as of foreign, prices have risen considerably: tick beans are at present worth 30s. to 32s., harrows 33s. to 35s., and pigeon 36s. up to 38s. per qr.: these rates are about 5s. per qr. higher than those current a month or six weeks ago; and the advance on foreign has been nearly as great—Egyptian in granary having lately sold at 26s. to 27s., and French would probably bring 30s. per qr. That the advance will lead to rather large importations from the near continental ports is more than likely; and we therefore regard present prices as somewhat hazardous for investments: still orders to some extent have been sent out to those places where the article is most likely to be procured.

Peas of home growth are very scarce in all parts of the kingdom, and the London splitters have experienced considerable difficulty in obtaining the quantity they have required to keep their regular customers supplied. White boilers have been sold at 35s., and really fine samples would readily bring that price, or perhaps 1s. to 2s. per qr. more. Grey cannot be bought below 32s. to 33s., and maples are held at 34s. to 35s. per qr. Peas appear to be nearly as scarce abroad as with us, and we do not anticipate large supplies for some time to come.

Indian corn was in rather active request in the commencement of the month for Irish account, and nearly the whole of the cargoes which arrived off the coast from the Black Sea, &c., were taken for that destination at rising prices—as much as 32s. to 33s. per qr., cost, freight, and insurance, having at one time been paid for Galatz, and corresponding rates for other descriptions. Latterly

the demand has slackened, and a slight reaction has taken place in quotations, both here and at Liverpool. Stocks of this article are reduced into a narrow compass at most of the Irish ports; but, should the potato crop turn out well, the consumption would diminish materially so soon as the new potatoes appear freely at market. It is the knowledge of this fact which has rendered buyers of Indian corn averse to purchasing cargoes that may be some time on the voyage, and the difference in price given for those close at hand and those at a distance has been rather important.

The wheat trade abroad has not varied materially; the weather on the continent has been similar to that experienced in this country. So long as the rain continued, holders showed a disposition to raise their pretensions; but the British demand not having been active at any time, the advance actually established has not been of much importance. The foreign merchants seem determined to speculate on the possibility of an indifferent harvest in England, and have thus far manifested great unwillingness to give way so as to allow prices to recede sufficiently to bring them under our quotations; wherefore few of the orders sent out from hence from time to time have been executed, and the shipments from the Baltic since the commencement of the spring up to this period have been comparatively trifling.

At Danzig prices have all along been relatively higher than with us, more especially for fine qualities; and as recently as the 21st inst. fine old high-mixed wheat in granary there was still held at 46s. per qr.

The arrivals from Poland had been on a moderate scale, better prices having been paid at Warsaw than could have been realized at Danzig. The quality of the Polish wheat of last year's growth is described as considerably inferior to that of 1850, and few of the parcels received had reached the weight of 60 lbs. per bushel. For a small lot of very fine, weighing 62 lbs., equal to 46s. per qr., free on board, had actually been realized.

The weather in the neighbourhood of Danzig had been dry, and it was feared that the spring-sown crops had suffered from drought. Most of the vessels previously arrived having been chartered, freights had rather advanced, and 2s. 6d. per qr. had been paid for London. The feeling was strongly in favour of a rise in the value of wheat, and very little encouragement from hence would be almost certain to lead to excitement there.

Advices from Stettin of the 22nd inst. inform us that the weather had for some days been exceedingly wet, which had encouraged sellers of wheat to demand higher prices; and some extent of local speculation having taken place, rather more money had been realized than could have been obtained earlier in the month.

The reports from Rostock are of a similar character; indeed, the general tendency in the Baltic markets was towards an advance, and good 61 lbs. to 62 lbs. qualities of red wheat, which might have been bought in the early part of the month at about 37s. 6d. to 38s. per qr., free on board, had risen 1s. to 2s. per qr.. Freights continued low, the number of vessels arrived out having been greater than had been able to obtain cargoes. The export demand for barley and oats had fallen off, and prices had consequently given way more or less. Beans and peas had, on the other hand, been in active request: of the former hardly any stocks remained, and the supplies of the latter had been quite trifling—at Stettin 30s. per quarter, free on board, had been paid for fair boilers.

The most recent advices from Hamburg inform us that holders of wheat had attempted to establish an advance on wheat, but that the export demand had not been sufficiently active to enable them to succeed in this object, and prices had remained much the same as before, say 38s. 6d. to 39s. 6d. per quarter, free on board at Lower Baltic ports, for 61 lbs. quality.

In the Dutch markets some very singular transactions have taken place, wheat having been bought there for shipment to England, at prices actually higher than those current in our markets.

These purchases have been going on for some time, and have created a good deal of surprise both in this country and in Holland. Last week 48s. per quarter, free on board, was paid at Amsterdam, for white Konigsburg of 62 lbs. weight, and at Rotterdam 42s. per quarter was realized for Sandomirka wheat.

In the French markets, prices have been influenced a good deal by the weather. About the middle of the month a rise took place in the value of wheat and flour at the principal markets; but subsequently the demand slackened, and the latest advices from thence state that the buyers had become unwilling to continue their purchases at the enhanced terms previously paid.

The accounts from the Mediterranean generally speak well of the prospects for the harvest in that quarter, and but little consumptive demand having been experienced, the tendency of prices had been rather downwards.

The letters from Odessa, Galatz, &c., also give favourable reports respecting the growing crops, and as far as any judgment can be formed at present, there is reason to believe that the produce of wheat will be good abroad as well as in this country.

From America we learn that the supplies of flour from the interior at the ports on the coast had fallen short of expectation; which circumstance, and the receipt from time to time of orders from Great

Britain, had caused prices to be well supported. At New York good brands of Western Canal had not been offered below 4⅛ dollars per barrel, which with 1s. 3d. to 1s. 6d. freight to Liverpool will bring the cost there somewhat over the present value of the article in that market. Shipments to a fair extent were nevertheless being made for England weekly, and we may calculate on regular supplies from the other side of the Atlantic.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.
Wheat, Essex and Kent, white	40 to 44 fine up to 51
Ditto ditto old	40 44 „ 51
Ditto ditto red, new	38 40 „ 42
Ditto ditto old	38 40 „ 43
Norfolk, Lincoln, & Yorksh., red	39 41 „ 42
Ditto ditto old,	none „ —
Ditto ditto white new	41 43 „ 45
Ditto ditto old	none „ —
Barley, malting, new	28 32
Chevalier	32 33
Distilling	26 29
Grinding	25 27
Malt, Essex, Norfolk, and Suffolk, new	51 53 extra 58
Ditto ditto old	43 46 „ 49
Kingston, Ware, and town made, new	58 59 „ 62
Ditto ditto old	48 51 „ 53
Irish feed, white	19 20 fine 22
Ditto, black	18 19 fine 21
Oats, English feed	18 19 fine 21
Ditto Potato	20 23 extra 25
Scotch feed	20 22 fine 24
Ditto Potato	22 24 fine 25
Rye	27 29 old 27 29
Beans, Mazagan	31 32 „ 32 33
Ticks	32 33 „ 33 34
Harrow	32 34 „ 33 35
Pigeon	35 36 „ 37 38
Peas, white boilers	35 38 „ 35 38
Maple	32 34 „ 32 34
Grey	30 32 „ 32 34
Flour, town made, per sack of 280 lbs.	— — „ 35 40
Country Households	— — „ 33 35
Norfolk and Suffolk, ex-ship	— — „ 28 31

FOREIGN GRAIN.

	Shillings per Quarter.
Wheat, Dantzic, mixed	41 to 43 high mixed 45 47 extra 53
Konigsberg	41 43 „ 44 45 „ 47
Rostock, new	40 41 fine old 43 45 „ 47
Pomera., Meckbg., and Uckermk., red	39 40 extra 42 45
Silesian	„ 39 40 white 42 44
Danish and Holstein	„ 37 39 „ 39 41
Rhine and Belgium	„ 39 41 old 41 43
French	„ 37 39 white 39 43
Odessa, St. Petersburg and Riga	33 35 fine 37 39
Barley, grinding	25 27
Distilling	28 29
Malting	none — —
Oats, Dutch, brew, and Polands	19 21
Feed	17 19
Danish and Swedish feed	18 21
Stralsund	20 21
Russian	20 21
French	18 20
Beans, Friesland and Holstein	28 31 Konigsberg 33 35
Peas, feeding	30 32 fine boilers 34 36
Indian Corn, white	28 30 yellow 28 31
Flour, French, per sack	28 32 fine 33 35
American, sour per barrel	18 19 sweet 20 22

IMPERIAL AVERAGES.

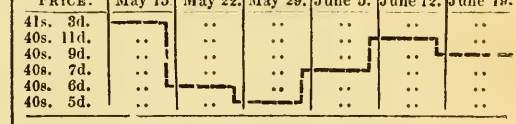
For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
May 15, 1852..	41	3	28	3	19	10	30	0	31	0	29	2
May 22, 1852..	40	6	27	10	20	1	30	5	31	6	30	9
May 29, 1852..	40	5	27	11	20	1	30	0	31	7	27	2
June 5, 1852..	40	7	27	5	20	8	30	6	31	6	31	0
June 12, 1852..	40	11	27	6	20	0	29	8	31	10	31	2
June 19, 1852..	40	9	27	5	20	2	30	7	32	0	31	9
Aggregate average of last six weeks	40	9	27	9	20	2	30	2	31	7	30	2
Comparative avge. same time last year	39	4	24	3	20	1	25	9	29	11	27	3
Duties	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1851.	Qrs.	Av. s.	d.
Wheat	100,671	40	9	Wheat	92,905	40	7
Barley	3,354	27	5	Barley	2,297	24	4
Oats	12,124	20	2	Oats	9,667	21	4
Rye	27	30	7	Rye	15	28	0
Beans	3,118	32	0	Beans	4,311	30	5
Peas	464	31	9	Peas	294	27	6

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING JUNE 19, 1852.



PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 50s. to 55s.; crushing 45s. to 48s.
Linseed Cakes (per ton) ..... £8 0s. to £8 10s.
Cow Grass (per qr.) ..... (nominal) .. 60s. to 70s.
Trefoil (per cwt.) ..... (nominal).. 21s. to 26s.
Rapeseed (per last) new £21 to £24 ..... old £21 to £24
Ditto Cake (per ton) ..... £4 5s. to £4 10s
Mustard (per bushel) .... white 5s. to 6s.; brown, 7s. to 9s.
Coriander (per cwt.)..... new 11s. to 13s., old 10s. to 12s.
Canary (per cwt.) ..... new 38s. to 40s.; old 39s. to 41s.
Tares, Winter, 28s. to 30s. p. qr.; Spring, 3s. 6d. to 4s. p. bush.
Carraway (per cwt.) ..... new, 33s. to 34s.; fine 36s.
Turnip, white (per bush.)..... Swede (nominal)
Cloverseed (per cwt.)..... red 40s. to 44s., fine 48s. to 50s.

FOREIGN SEEDS, &c.

Clover, red (duty 5s. per cwt.) 40s. to 48s. per cwt., super. 50s.
Ditto, white (duty 5s. per cwt.) ..... 40s. to 46s. per cwt.
Linseed (per qr.).... Baltic, 44s. to 47s.; Odessa, 46s. to 48s.
Linseed Cake (per ton) ..... £7 to £9 10s. 0s.
Rape Cake (per ton)..... £4 5s. to £4 10s.
Hempseed, small, (per qr.) 32s. to 34s., Do. Dutch, 36s. to 37s.
Tares (per qr.) ..... small 28s. to 30s., large 30s. to 32s.
Rye Grass (per qr.) ..... 28s. to 35s.
Coriander (per cwt.) ..... 10s. to 13s.

HOP MARKET.

BOROUGH, Monday, June 28.

The few Hops on offer meet with a steady sale, at the improved quotations noticed in our last report.

Sussex pockets..... ..... 112s. to 128s.
Weald of Kent ditto ..... 130s. to 147s.
Mid and East Kent ditto .. 140s. to 250s.

With few exceptions throughout Kent and Sussex the hop bine is growing rapidly. In some cases the leaves show a tendency to turn yellow. Fine warm weather will now be looked for with anxiety.

PRICES OF BUTTER, CHEESE, HAMS, &c

	s.	s.		s.	s.
Friesland, per cwt.	70	to 72	Double Gloucester, per cwt.	46	to 56
Kiel	66	70	Single do.	42	48
Dorset ..... new	76	80	York Hams	60	70
Carlow ..... „	—	70	Westmoreland do..	60	66
Waterford.... „	—	68	Irish do.	56	62
Cork ..... „	—	66	American do.	28	36
Limerick .... „	—	60	Wiltshire Bacon, green	60	62
Sligo ..... „	—	64	Waterford Bacon..	56	60
French Butter, per doz.	8	10	Hamburgh do.	54	57
Cheshire Cheese, per cwt.	50	70	American	—	—
Chedder do.	56	68			

BELFAST, (Friday last.)—Butter: Shipping price, 65s. to 77s. per cwt.; firkins and crocks, 7d. per lb. Bacon, 48s. 50s.; Hams, prime, 58s. to 62s.; second quality, 50s. to 52s. per cwt.; mess Pork, 86s. per brl. Irish Lard, in bladders, 54s. to 56s.; kegs or firkins, 52s. per cwt.

June 24.	Butter. per cwt. s. d.	s. d.	Bacon. per cwt. s. d.	s. d.	Dried Hams. per cwt. s. d.	s. d.	Mess Pork. per brl. s. d.	s. d.
1848	80 0	82 0	58 0	62 0	66 0	72 0	80 0	84 0
1849	67 0	68 0	48 0	50 0	68 0	75 0	76 0	78 0
1850	60 0	68 0	37 0	42 0	65 0	70 0	60 0	62 0
1851	70 0	74 0	45 0	47 0	62 0	66 0	64 0	66 0
1852	74 0	78 0	48 0	50 0	56 0	60 0	77 6	82 0

HULL COMMERCIAL MARKETS.

LINSEED: The diminished consumption going on in consequence of mill-stoppage causes an extremely light business to be done from day to day, and the few transactions are about the quotations of last week. In RAPESEED no business passing. For LINSEED OIL the demand for the home trade has been well sustained, and for export to the continent sales are also made; the demand exceeding the supply. RAPE OIL has not altered in value. Of OLIVE OIL the few parcels here are either disposed of or withdrawn. SEAL OIL: All the recent arrivals from Greenland are cleared, and £32 10s. to £33, in casks, is now required. TALLOW has advanced to 39s. 6d. for Petersburg first sort Y.C., and little business going forward. LINSEED CAKES are in very limited demand, as the season for feeding fat stock is about over. RAPE CAKES have been taken less freely for present consumption, and 93s. to 92s. 6d. cannot be exceeded for fine foreign oblong to keep over. GUANO: The season is approaching to a close, but still sales are making of Government Bolivian. Of BONES we have good supplies from recent arrivals; buyers are, however, more scarce for the existing season, and a slight decline in price has occurred.—*Hull Herald.*

HIDE AND SKIN MARKETS.

	s. d.	s. d.	
Market Hides, 56 to 64 *lbs.*	0 0	*to* 0	1¾ *per lb.*
Do. 64 72 *lbs.*	0 1¾	0 2	„
Do. 72 80 *lbs.*	0 2	0 2¼	„
Do. 80 88 *lbs.*	0 2¼	0 2½	„
Do. 88 96 *lbs.*	0 2½	0 3	„
Do. 96 104 *lbs.*	0 3¼	0 3½	„
Calf Skins, light	1 0	2 6	*each.*
Do. full	3 6	4 6	„
Horse Hides	5 0	0 0	„
Shearlings	0 11	1 2	„
Lamb Skins	1 8	2 9	„

BARK.

Per load of 45 cwt.

English Tree	£11	0	0	*to*	£13	10	0
Coppice	12	0	0		14	0	0
Mimosa *per ton*	10	0	0		11	0	0
Valonia „	14	0	0		16	0	0

OILS.

Linseed, 28s. per cwt.; Rapeseed, English refined, 32s. to 32s. 6d.; do. foreign, 32s. 9d. to 33s.; brown, 31s.; Galipoli, per tun, 45*l.*; Spanish, 45*l.*; sperm, 87*l.* to 89*l.*; do. bagged, 86*l.*; South Sea, 33*l.* to 36*l.*; Seal, pale, 33*l.* 10s.; do., coloured, 30*l.*; Cod, 34*l.*; Pilchard, 28*l.* to 30*l.*; Cocoa Nut, per ton, 38*l.* to 40*l.*; Palm, 29s. 6d.

WOOL MARKET.

BRITISH WOOL.

BRIDGNORTH.—At our wool fair last week the prices ranged from 1s. 1d. to 1s. 4d. per lb.

DONCASTER, (Saturday last.)—There was a very large supply of Wool—upwards of 500 sheets. The morning being wet, very little business was done early on, and the weather operated against the sellers. We note no alteration in value from last week, where wool was dry. Fine qualities of hog wool were most in request, and low qualities of ewes and wethers not so free sale. The following are the quotations: Locks and cotts, 8s. 6d. to 11s. 6d.; ewes and wethers, 12s. 6d. to 13s. 6d.; Lincolnshire, one-third to one-half hog, 14s to 14s. 6d.; Nottinghams and Yorks, fine, 15s. 6d. to 17s.

HULL, June 22.—This was the first wool market dinner of the season, and, being rather late, there was a good show, upwards of 150 sheets being pitched, and nearly all sold. The market had a good attendance of buyers. All hog, 14s. to 15s. 6d.; half hog and ewe, 13s. 6d. to 14s.; all ewe, 12s. to 13s.; locks and cots, 7s. to 8s. 6d. per stone.

LEEDS, June 25.—Stocks of combing wool at market continue very light. There is a steady demand to supply the immediate wants of the manufacturers. Prices are firm at last week's rates, with an upward tendency; but it is impossible to realize quotations in proportion to the high rates asked by the farmers for new wool.

NEWPORT (MONMOUTHSHIRE).—We never saw so much wool pitched in Newport as there was on Wednesday Trade was dull, and prices did not exceed 15s. per stone.—*Gloucester Chronicle.*

YORK, June 24.—At this, our sixth market for the new clip, we had about 620 sheets of wool, being 100 more than last week, and 40 above the corresponding week of last year; 600 sheets were sold, and 20 remained on hand. Among the prime lots of wool shown were 33 sheets by Mr. D. Sellers, of Octon Lodge, which was admired for its clean condition and light flaky quality. The following were the quotations, being the same as last week:—Hog and ewe fleeces, Masham, 9d. to 10d. and 11d.; all ewe, good bred, 10d. to 11d. one-third hog and ewe, 11d to 11½d.; two-thirds ditto, 11d. to 12d.; all super hog, 12d. to 12½d.; ditto, if of super auper quality, and in very clean condition, 12½d. to 13d. per lb. Locks and cots are eagerly sought after, at the following prices:—Locks, 7½d. to 8½d.; cotted fleeces, 9d. to 10d. per lb. The supposed influence of the Australian wool question, upon the prices of Yorkshire wools, seems to have died away.

LIVERPOOL, June 26.

SCOTCH.—There has been some demand for Laid Highland Wool this week, and some superior clips sold at very full rates. No White Highland in the market. Good Cheviots and Crossed are more inquired for; middling and inferior kinds are still difficult to dispose of.

		s. d.		s. d.	
Laid Highland Wool, per 24 lbs.		9	3	to 10	3
White Highland do		12	6	14	0
Laid Crossed	do...unwashed	10	6	12	0
Do.	do...washed	11	0	12	6
Laid Cheviot	do...unwashed	11	6	13	0
Do.	do.. washed	12	6	15	0
White Cheviot	do... do.	22	0	26	0

FOREIGN.—The arrivals this week appear considerable, but the greater portion are Alpaca, nearly all sold to arrive. The stocks of all kinds of Wool are light, consequently little to do, or were there a better choice more would be doing.

FOREIGN WOOL.

LEEDS, June 25.—There has been considerable inquiry since the close of last sales for all descriptions of foreign and colonial wool. Prices are well maintained.

WHALEBONE.

Polar, per ton ..... £180 0 0 *to* £0 0 0

Printed by Rogerson and Tuxford, 246, Strand, London.

A Hereford Ox

the property of Mr William Heath of Sutham Hall near Wisbitch for which the First Prize of £50 and the Silver
Medal were awarded at the Smithfield Club Cattle Show Dec.r 1850.

London Published by Ingram & Cleave 198 Strand

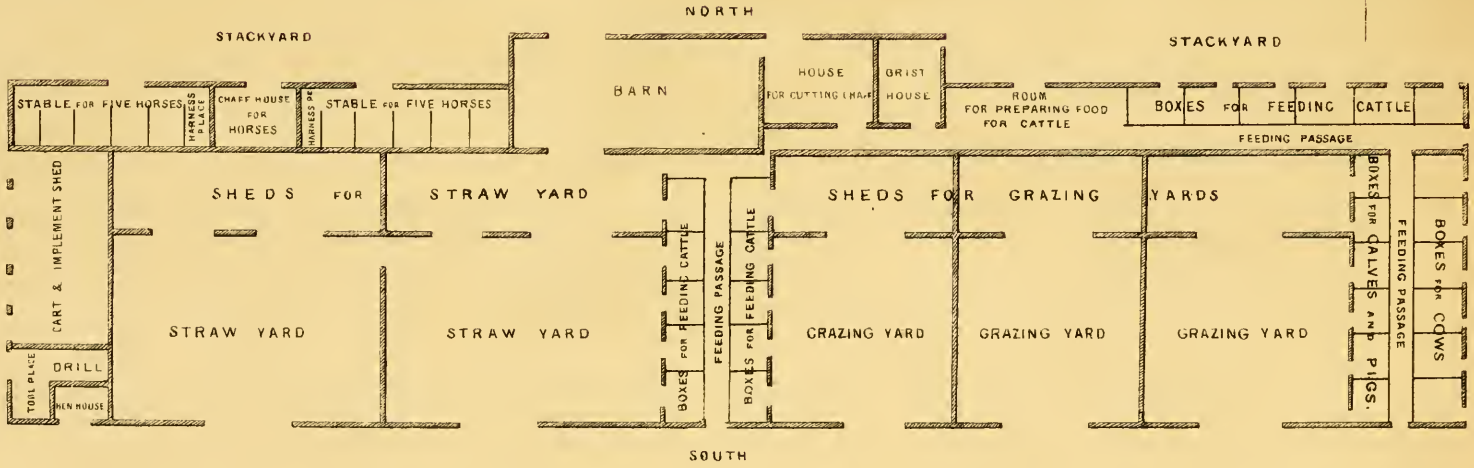

BARN
STABLES
CATTLE BOXES
CART SHEDS
STRAW YARDS
OPEN
WITH
SHEDS
CATTLE BOXES
CRA-
WITH
ZINC
OPEN
YARDS
SHEDS
COW HOUSES

PLAN OF

FARM BUILDINGS

BY

Mr CHAS P. TEBBUTT.



Scale of ½ Inch to ten Feet.

ROGERSON & TUXFORD,

246, STRAND, LONDON.

THE FARMER'S MAGAZINE.

AUGUST, 1852.

PLATE I.

A HEREFORD OX.

The subject of our first plate is a Hereford Ox, the property of Mr. William Heath, of Ludham Hall, near Norwich, for which the first prize of Thirty Sovereigns and a Silver Medal were awarded at the Smithfield Club Cattle Show, in December last.

PLATE II.

PLAN OF FARM BUILDINGS.

BY MR. CHAS. P. TEBBUTT.

(For description see page 110.)

AGRICULTURAL BIOGRAPHY.

It has been often observed that nations are very considerably advanced in civilization before they commit to writing records or memorials of any kind, and that a much greater progression has been made before any notice has been bestowed on the most simple and necessary of all the arts of practice, in the use of the earth for procuring the necessaries of life. The very imaginative philosophy of the Greeks, who were the first historians, scarcely condescended to bestow a glance on the art of obtaining the fruits of the earth; a very few incidental notices afford an imperfect gleaning from the field of practice which they had adopted, and their speculative conceptions continued to lead astray their minds from the useful arts of life till their political and moral grandeur sunk and was extinguished in the western hemisphere. Even the more practical acuteness of the Roman people, who succeeded the splendour of the Greeks, did not adopt agriculture as a topic of illustration till the period of the Christian era, when their grandeur had passed its zenith and the radiance had begun to wane. The records they made are few, and the knowledge was scanty and imperfectly conveyed. In Britain the long period of fifteen centuries had elapsed before the practice of agriculture was honoured with a written notice, when the discovery and use of printing had begun to diffuse its blessings, and to show the effects of the mightiest power that has yet been given to man. So long a time was required to emancipate the human mind from the fetters of bondage with which it was manacled by the dominion of feudal power, and to escape from the meshes of a closely-woven network thrown over it by the darkening bigotry of a most intolerent religious superstition. When these barriers of degradation and buffoonery were removed, the dignity of the human mind was soon revealed, and exhibited its inherent splendour.

Learning received advantages from the invention of printing, which spread the dominion of knowledge to an immeasurable distance beyond its former limits; there soon appeared a necessity of collecting and condensing the widely-scattered materials into such limited forms as were easy of access and distinctly correct. Hence have arisen the dictionaries, lexicons, and bibliothecs of modern times; and not for the interpretation of words, for

these were always frequent, but for the explanation of things.

In tracing the progress of an art from the lives and writings of the inventors and improvers, the practical knowledge is derived which sees the foundation of the system that has arrived, and perceives the difficulties that are to be overcome, and the contentions that are to be encountered in making any deviation from established usages. In biographical notices the most prominent circumstances are selection, compass, and arrangement. The alphabetical order is very justly preferred to any other method, and has obtained a universal adoption; but our special purpose differs from general compilations—in these no order is attempted of any particular object: the descriptions are general, and relate to persons, and not to any specific point. Our attention is directed to the gradual progress of agriculture as it received assistance and illustration from the writings of theoretical and practical men; and the view is more turned to the art than to the person, and to the result than to the originator; not that the prime mover will be neglected—on the contrary, that person is entitled to the first consideration; but successive improvers must be regarded, and the advancement which the art received from their labours.

This very important consideration, and the impossibility of finding the date of the birth of the writers, and the scanty memorials that can be got of their worldly sojourn, has induced the chronological arrangement by the date of the published work, and of the first work when more than one came from the same author. This order continues the gradation of improvements, and tends to show the assistance which may have been in any case derived by an author from a preceding treatment of a subject. This is a chronological list of the steps in the ascent of the art, and not of the births or lives of the authors; it shows how the foundations were laid, and by what means the edifice has been reared. The dates compose the chronology in the notice of the authors; and there is added, in the common way, an alphabetical list of the authors by the initial letter of the surname, so that the notice of any author can be found at the page of the book that is attached.

The difficult point of selection is summarily dismissed, for our list comprehends every British author of whom any notice can be found from the most careful and patient research; we shall thus escape the charge of partiality and nationality in choosing and rejecting names for notice, and will only incur the risk of showing favour or neglect as our narrative proceeds. Much attention is due to the age or period when the author lived; and a fair allowance should be made, and a just proportion observed, of the ease and abundance with which the materials are procured as the times of existence approach our own days. It is true that the subject becomes much more interesting in the more advanced stages of progress than in the early dawn, but greater care is due on that account to the investigation of the causes of movement.

The compass, or extent to be allowed in such works, is a point of value, as biography will certainly bear of being written much at large, and the more minute it is, it often becomes the more entertaining and instructive when judiciously handled. Here again our special object is intruded—a series of finished and full-sized portraits, or a set of characteristic sketches in miniature, is not the aim; but a gradual tracing of the progress of the most necessary of all the arts that are practised by mankind. Consequently, the first attention is the relative merit of the writer in the department which he occupied, and joined with the manner in which he was first formed to his art or profession, and the gradations by which he rose to excellence. The principal events of his life shall not be overlooked, nor his moral and intellectual qualities, but related with all the accuracy that conciseness will allow. There will be higher claimants which require a diffuseness, and an inferior rank that will obtain a more brief notice. The materials to be got will chiefly influence the compass of our notice of the rural authors; the researches of former enquirers shall have our gratitude expressed, and the accuracy and impartiality will not be doubted, especially when confirmed by mutual agreement. The substance of different narrations will be melted into one, the several parts proportioned, and the characteristic features carefully marked and stamped by an unbiassed judgment, which may aspire at least to the rank of original writing. The gratitude of mankind is most justly due to the useful labours of industry, which has benefited the human race, and has held out the lamps of genius and of experience to show the paths to future enquirers, and to warn the dangers of ill-directed employments; a re-union is formed with existence in its most excellent state, and nothing is felt to be dead in the past while the sympathies are retained that only require to be awakened. The labour is not without its difficulty of assigning the due proportion of attention and respect which may be owing to the competitors of fame, as the risks of falling into errors are much more numerous than the means of avoiding them. It is very difficult to decide between the merits of invention and improvement, as no precise line can be drawn between the two exertions of intellect. The history of the human mind does not present anything more curious than

to trace the operations of an inventive talent working its way, often without any foreign aid, and deriving from its own resources the means of overcoming the successive difficulties which thwart its progress. It is in such a process that the distinguishing powers bestowed upon man are most surprisingly exerted, and that the superiority of one individual over the common mass is most luminously displayed. The exercise of the faculties in an original path is entitled to the first consideration, and the successive improvers are not much beneath original talent in the merit of pushing forward the gradual advances of a particular pursuit till a very uncommon excellence was attained. A vigorous exertion of the faculties is required, and a most energetic and persevering industry, in order to confer an addition so considerable as to deserve a special commemoration. A just title to have the name perpetuated may belong to the person who has reached an uncommon excellence without showing any originality or improvement, since it shows a very large use of the rational powers, and affords animating examples of the possibility of effecting extraordinary things. Many names of high reputation are included in this class, and have been noticed accordingly.

A man is his own monument, and must be estimated by the foundation which he has laid, and by the duration of the superstructure. A very large attention is due to the time in which he lived, and to the circumstances by which he was surrounded —to the education of the age, and to the policy of the political and social rule that existed. The advancement of arts and sciences depends as much on these establishments as on individual exertion; and the stirrings of the human mind require impulses in the two-fold capacity of a recipient and an exponent. These circumstances shall be duly noticed at the periods of occurrence, and will be attended with appropriate observations.

Necessity compels our being indebted to former biographers for notices and events; but in every case of the books being accessible to our research the private opinion of professional judgment will be used, and an impartial criticism bestowed. The particular attention will be directed to the merits of the author as an original thinker, an arduous improver of adopted ideas, or the follower of a beaten path, which he has rendered more even and of greater width than when he entered upon the track. When no opinion can be formed, the relations of other writers will be stated, and the authorities given. To trace the gradual progress of the art is the main object of our purpose, and to that end the chief attention will be directed. The introduction to agricultural biography need not be more extended—a large book is the harbour of ignorance, and compression is even more powerful than expansion. The preface to a book has been compared with the porch to a house, as both provisions denote a good cheer and commodious treatment within the edifice. Yet lengthy prefaces and clumsy dedications are only suited to the huge quartos within which ignorance, bigotry, and superstition, have ever been irrepugnably entrenched, and have bid defiance to the attacks of the lighter bulks of matter. Truth and reason are the best patrons of a book, and form a monument much more lasting than brass. Patterns are exhibited of acquiring a power over all external objects, and of maintaining

> "That strong divinity of soul
> Which conquers chance of fate."

And

> "Lives of great men all remind us
> We can make our lives sublime,
> And, departing, leave behind us
> Footsteps on the sand of time—
> Footprints that perhaps another,
> Sailing o'er life's solemn scene,
> A forlorn and shipwreck'd brother,
> Seeing, may take heart again."

Our chronological record begins with a name that is not strictly connected with practical agriculture, but whose profession very much contributed to lay the foundation of the laws of real property, of which land is the chief type. Without a foundation on which to rest firmly and securely agriculture could not have progressed, nor could improvements have been rewarded by the maxims of justice and equity.

I.—Lyttleton, 1480.

Thomas Lyttleton was a celebrated English judge, and was born about the beginning of the fifteenth century. His father was Thomas Westcote of the county of Devon, who, by marrying the daughter and sole heir of Thomas Littleton, or Lyttelton, of Frankley, in Worcestershire, inherited an estate of land, and the issue assumed the name that belonged to it. The family has risen to the title of Lord Lyttelton of the present day. Our author studied the law, and soon became eminent in the profession; and, after passing through several offices, was appointed in 1466 one of the Judges of the Court of Common Pleas. He enjoyed much esteem till his death in 1481.

The memory of Judge Littleton is preserved by his "Tenures," of which the numerous editions evince the estimation. Twenty-four editions were printed from 1539 to 1639. The original composition of this celebrated work is justly esteemed as the principal pillar on which the superstructure of the law of real property in this kingdom is supported; and it has been much commented upon

by Coke and others. There was a book written in the reign of Edward III., which is called "Old Tenures" to distinguish it from Littleton's book. It gives an account of the various tenures by which land was holden, the nature of estates, and some other incidents relating to landed property. It is a very scanty tract, but has the merit of having led the way to Littleton's famous work.

The copy of "Tenures," in George the III.'s library in the British Museum, is in vellum of 1671, and printed in opposite columns of French and English. It is thought that the work was first published in French, and that the English addition was published by the author himself the year (1480) before his death (1481).

II.—Grosthead, 1500.

Robert Grosthead, Grouthead, or Grosseteste, for the name had no less than twelve different spellings, was Bishop of Lincoln in the thirteenth century, and a person of note in those times. He is reputed to have been born in 1175, of honest parentage, at Stradbrook, in the county of Suffolk. He rose to the bishopric more rapidly than many others through the minor gradations of office, and proposed many alterations and reforms in the then very gross abuses of the Romish church; but he was wholly overborne by clamour and upset by prejudices, as the time of reformation was not then come. He died in 1253.

Grosthead was a most voluminous writer, and on a great variety of subjects. His works are stated at 200 in number, of which few have been published, and hence may not have been thought to be worth the publication. The old catalogue of the Peterborough library ascribes to the Bishop "Liber qui vocatur Housbondrie," or "A Treatise of Husbandry, which Mayster Groshede, some time Bishop of Lincoln, made and translated out of French into English." It has been supposed that the bishop only translated it from French; and, otherwise, that he first wrote it in French and then rendered it into English. Somebody has turned it into Latin. Among Bishop More's works, in the public library at Cambridge, is a 4to "Buke of Husbandry." Under this title, on a scroll, is the cut of a person standing in a wood or park giving orders to a woodman who is felling a tree. It contains 18 leaves. "Here begynneth a Treatise of Husbandry, which Mayster Groshede, sometyme Byshop of Lyncoln, made and translated out of Frenshe into Englyshe, which techeth all manner of men to governe theyr lands, tenements, and demenes ordinatly, as by the chappytres evidently is shewed." It concludes with, "Here endeth the buke of husbandry, and of plantynge and graffynge trees and vynes." No date or printer is mentioned.

This book is not found in the library of the British Museum, nor is mentioned among the bishop's works in the "Bibliotheca Britannica." The late Mr. Loudon has stated that the book is a 4to volume, and printed by Wynkin de Worde; but he has not mentioned if he had himself seen the work, or had conversed with any person who had examined it. We are, therefore, unable to give an extract from the book, or to quote any opinion of its contents. "The Buke of Husbandrie," 4to, appears in the list of books printed by Wynkin de Worde, but no date nor author is mentioned.

III.—Fitzherbert, 1532.

Sir Anthony Fitzherbert was born at Norbury, in Derbyshire, where his family enjoyed a landed patrimony, and held a very respectable position in society. The date of his birth is uncertain. After receiving the usual education for the legal profession he was called to be Serjeant-at-law in 1511, in 1516 he received the honour of knighthood, and in 1523 was appointed one of the Justices of the Court of Common Pleas. He soon began to show an independent eminence in his profession—openly opposed Cardinal Wolsey in the height of his power; and, on his death bed, most earnestly pressed his children to accept no grants, nor to make any purchases of church lands. The death of his elder brother John left him the possession of the family estate, which enabled him to make a good provision for his numerous family. He died in 1538, and was buried in his own parish church of Norbury. The Fitzherbert family, in the different branches of it, continues to flourish chiefly in Derbyshire and Staffordshire. The late Mrs. Fitzherbert, of court notoriety, was a descendant of the family.

The legal works of the learned Judge of the Court of Common Pleas were numerous and valuable. In 1532 there appeared "The Book, or Boke, of Husbandry, very profitable and necessary for all persons," which was afterwards often reprinted without date. In 1539 there appeared "Of the Surveying of Lands," in a small 8vo, containing 120 pages in black letter, imprinted for Berthelet. This treatise consists of instructions to noblemen and gentlemen who are the managers of their own estates, and to land stewards, bailiffs, &c., who are under them. It sets forth likewise the nature of tenants' tenures, and the laws of court baron, court hundred, chartuaries, &c., being a sort of commentary on an old statute named "Extenta Mancrii."

The "Boke of Husbandrie" of Sir Anthony Fitzherbert is the first work in the English language which treats expressly on the subject of practical agriculture. It has been supposed that his brother,

who lived on the landed estate, had written the matter of the book, and that the judge had revised the contents, as he states it to be the production of a forty years' experience. Others think that the intervals of his legal employments were devoted to rural pursuits, and that he mentions the period of his attention to have been in that number of years. The copy of the book in the British Museum is dated in 1548, and contains 180 duodecimo pages. It describes the ploughs then in use, and the different articles of tillage, and which specially belong to a team of horses. The wheels of carts and waggons are recommended to be shod with iron, whence it may be inferred that in those days these vehicles were altogether composed of wood. The author prefers oxen to horses for rural labour, and at the same time frankly admits that horses will go much faster than oxen on even and light land, and that they are quicker for all sorts of carriage work. It required the enlightened progress of nearly three centuries after the time of Fitzherbert to banish this prejudice anent oxen and horses, though nature has very sufficiently settled the point in the muscular formation of the animals. It lingers now only in some parts of South Britain, where latent barbarisms of the mind, as in flail threshing, appear to be more deeply rooted than in other soils. It would seem that the husbandman in Fitzherbert's days combined a knowledge of every profession; for among the appendages of a plough we fine an axe, hatchet, hedge-bill, anger, flail, spade, and shovel very particularly enumerated. It is also recommended that young husbandmen should learn to make their yokes, ox bows, stools, and all manner of plough gears, lest the purchase of these articles be too costly for them. He advises that the huswifes, or the wives of farmers, perform all manner of work, in baking and brewing, winnowing corn, driving and filling the dung carts, and attending the grinding mills where the different flours are made. The wives of the present day will not much relish this advice.

As Fitzherbert's book is the first expressly practical work on agriculture, we are induced to give at length the contents as arranged in the edition of 1543.

HUSBANDRIE.

Here begynneth the Boke of Husbandrie, and, furste, where bye husbandmen do lyve.

The last page of the book contains these words:—

"Thus endeth the ryghte profytable Boke of Husbandrye, compyled sometyme by Mayster Fitzherbarde, of charitee and good zele that he have to the weale of this most noble realme, which he did not in his youth, but after he had exercised husbandry, with greate experience, forty years."

In the information given to the young gentleman the author says—"And over and beside all this boke, I will advise him to rise betime in the morning, according to the verse before spoke of—'Sanat, sanctificat, et ditat surgere mane'—and to go about his closes, pastures, fields, and specially by the hedges; and to have in his purse a payre of tables, and when he seeth any thing that wolde be amended to wryte it in his tables—as if he fynde any horses, mares, beastes, shepe, swyne, or geese, in his pastures that be not his owne; and, perauventure, thoughe they be his owne, he wolde not have them to go there; or to fynde a gap, or a sherde in his hedge, or any water standynge in his pasture uppon his grasse, wherby he maye take double herte, bothe losse of his grasse and rotting of his shepe and calves; and also, of standynge water in his corne fieldes at the landes endes or sides, and howe he would have his landes plowed, donged, sturred, or sowen; and his corne weded or shorne, or his cattell shifted out of one pasture into another; and to loke what dyching, quicsettying, or plashing, is necessary to be had; and to oversee his shepeherd how he handleth and ordreth his shepe, and his servantes how they plowe and do their workes; or if any gate be broken down, or want any stawes, and go not lyghtly to open and tyne, and that it do not traise, and that the windes blowe it not open, with many mo necessary thynges that are to be looked upon. For a man alwaye wanderynge, or goinge aboute, fyndeth or seeth that is amysse and wolde be amended; and as soone as he seeth any suche defautes than let hym take oute his tables and wryte the defautes; and when he commeth home to dinner, supper, or at nyght, than let hym call his bayley, or his heed servante, and soo shewe hym the defautes that they may be shortly amended; and, when it is amended, than let hym put it out of his tables. For this used I to doo X or XI yeres and more, and thus let hym use dayely, and in shorte space he will sette moche thynges in good order, but dayely it wyll have mendynge; and yf he canne not wryte, lette hym nycke the defautes uppon a stycke, and to shewe his bayely,

as I sayde before. Also take hede, both erly and late, at all tymes, what maner of people resorte and comme to thy house, and the cause of theyr commynge, and specially if they brynge with them pitchers, cannes, tancardes, bottelles, bagges, wallettes, or bushell pokes; for if thy servantes be not true they maye doo thee great hurte, and themselfe lyttel avauntage, wherefore they wold be well looked uppon. And he that hath two true servantes, a man servante and an other a woman servante, he hath a great treasure, for a trewe servante wyll do justly hymself, and if he see his felowes do amysse he wyll byd them do no more so, for if they do he wyll shewe his master therof—and if he do not this he is not a trewe servante."

The directions given in folio 64 to a gentleman's servant, that he may leave nothing behind him at an inn, are worth transcribing:—

"Purse, dagger, cloke, nyghtcap, kerchief, boryng bonne, baget and shoes, speare, mase, hoode, halter, saddel clothes, hatte, with thy horse combe, bowe, arrowes, sworde, buckler, horne, leifshe, gloves, stringe, and thy bracer; penne, paper, inke, parchesmente, readwayes, pommes, cakes, thou remembre; penknyfe, combe, thymble, nedle, threde, poyntee, lest thy gaithe breake; bodkyn, knyfe, fyngel; give thy horse meate; see he be stowed well; make mery; sing if you can; take hede to thy gere that thou lose none."

Fitzherbert seems to have understood the word "husbandry" in the enlarged and proper meaning, as he gives directions in the husbandry of moral and religious conduct as well as in the husbandry of the ground. Husbandry relates to every action and vocation of life, as does economy to the rules and regulations of all enterprizes and performances, and by no means to the pinching niggardliness of the necessary appliance, as is generally understood. Husbandry relates to all the members of the employment—economy directs the applications to every special point.

Our lengthy notice and quotations from Fitzherbert's book are intended to show the reader a specimen of the writing contained in the first English work on practical agriculture, and also to the heads of the divided matter which forms the volume. The author was the first native of Britain that studied the nature of soils and the laws of vegetation with philosophical attention. On these he formed a theory confirmed by experience, and rendered the study pleasing as well as profitable by realizing the principles of the ancients to the honour and advantage of his country. These books, being written at a time when philosophy and science were but just emerging from that gloom in which they had so long been buried, were doubtless replete with many errors, but they contained the rudiments of true knowledge, and revived the study and love of agriculture.

IV.—Benese, 1535.

Sir Richard Benese was Canon of Marton Abbey, near London. No memorials exist of this writer except the book on measuring land, to which his name is affixed. The copy in the British Museum is without date, and in black letter. The title page is "The Boke of Measuring Land, as well as of Woodland, and Pastime in the Field; and to Compt the True Number of Acres of the Same." Newly corrected and compiled by Sir Richarde de Benese. Imprinted at London, by Thomas Colwell.

The book contains 112 duodecimo pages, figures of the shape of lands, the dimensions, and the contents. Two short chapters are added on measuring timber and stones. Three editions were published—in 1535, 1538, and the last without date, which is now mentioned.

V.—Tusser, 1557.

Thomas Tusser was born about the year 1515, at Rivenhall, near Witham, in Essex, where his father, William Tusser, married a daughter of Thomas Smith, of Rivenhall, by whom he had five sons and four daughters. Hence our author referred to the heralds' book for the gentility of his family, and says he "was born of lineage good and gentle blood." The name and race, however, have long been extinct. He was educated as a musician, and was soon placed as singing boy in the collegiate chapel of the castle of Wallingford; and, after frequent change of places and enduring many hardships, he was admitted into St. Paul's, where he attained considerable proficiency in music. He was sent to Eton school, and thence to Cambridge, where sickness interrupted his studies, and, having left the University, he was employed about court, probably in his musical capacity, by the influence of his patron William Lord Paget. He appears to have been a retainer in this nobleman's family, and he mentions his lordship in the highest terms of panegyric.

He remained ten years in this situation, and then, retiring into the country and marrying, became a farmer at Cattiwade, in the parish of Brantham, county of Suffolk, near the river Stour. Here he composed his book on husbandry, the first edition of which was published in 1557, and dedicated to his patron Lord Paget. This rude essay, in "one hundred points of good husbandry," was the gem of his future and more elaborate work, and must have required at least several years' acquaintance with rural affairs. He may have experienced a reverse in farming, as he is found in Ipswich, where his wife died, at West Dereham, and

at Norwich. He married a second time, but did not add to his happiness. He next obtained a singing-man's place in the cathedral of Norwich, then tried farming again at Fairsted, near his native place; and, again failing, he repaired to London, and, flying from the plague in 1574, he went to Cambridge. When the scourge abated he returned to London, and died there, as is generally supposed, about 1580, and was buried in St. Mildred's Church, in the Poultry, with an epitaph by himself, as recorded by Stow—

" Here Thomas Tusser, clad in earth, doth lie,
Who some time made the Points of Husbandry;
By him then learn thou mayst, here learn we must,
When all is done, we sleep and turn to dust;
And yet, through Christ, to heaven we hope to go:
Who reads his books, shall find his faith was so."

Tusser's second work, " Five Hundred Points of Good Husbandry," appeared in 1580, and must have been well received, as above twelve editions were printed within the first fifty years, and many others since that time. The best editions are of 1580 and 1585, but they are very scarce. In 1812 Dr. Manor published a new edition, carefully collated and corrected, with a series of notes, georgical, illustrative and explanatory, a glossary, and other improvements.

Tusser's book is written in quatrains, or stanzas of four verses each, in doggrel rhyme, and very obsolete. He gives the corn harvest, equally divided into ten parts :—

" 1. One part cast forth, for rent due out of hand;
2. One other part, for seed to sow thy land;
3. Another part, leave parson for his tithe;
4. Another part, for harvest, sickle, and scythe,
5. One part, for plough-wright, cart-wright, knacker, and smith;
6. One part, to uphold thy teams that draw therewith;
7. One part, for servant, and workman's wages lay;
8. One part, likewise, for fill-belly, day by day;
9. One part, thy wife for needful things doth crave;
10. Thyself and child the last one part would have.

" Who minds to quote
Upon this note,
May easily find enongh;
What charge and pain,
To little gain,
Doth follow toiling plough.

" Yet farmer may
Thank God and say,
For yearly such good hap,
Well fare the plough,
That sends enow,
To stop so many a gap."

For an author, the vicissitudes of the life of Tusser present a very uncommon variety of incident. He had no vicious extravagance, or any tincture of careless imprudence, and yet his desultory character did not thrive in any vocation. He failed in farming as his chief pursuit; and, although he may have been a good theorist for the time, his practice was much behind. He is said to have been a good-natured, cheerful man, a lover of economy, and far from meanness, as appears in many of his precepts, and always condemns the policy that would rather lose a pound than spend a shilling. He has been thought an able farmer, and placed on a level with Varro, Columella, and Palladius, and probably more aptly with Hesiod. Both wrote in the infancy of husbandry, and gave good general precepts without going into detail, though Tusser has more of it than Hesiod. They address the minds as well as the lands by recommending industry and economy, and used verse as the more effectual means to propagate their doctrine.

The precepts of Tusser are excellent, and show very much cool collected sense; but the temptations and perplexities of life very frequently overturn the maxims and resolutions of prudence, and create a wide discordance between the very best intentions and the results of circumstantial necessity. Cultivated minds and lively imaginations do not always offer the steadiest and most effectual resistance to the shocks of adversity, and the rebuff that attend almost every enterprize; and Tusser's singing gentility and courtly breeding may not have well accorded with the frugal care and persevering industry which are most essential to the success of every agricultural undertaking. Beyond most other employments farming requires the most active and energetic perseverance, combined with the most minute and careful attention.

The following head-piece appeared in 1641 :—

" Tusser, they tell me, when thou wert alive,
Thou, teaching thrift, thyself could never thrive;
So, like the whetstone, many men are wont,
To sharpen others, when themselves are blunt."

Tusser divides the gross produce of the lands into ten purposes, of which the rent is only one distribution. He allows three-tenth parts to the farmer's maintenance, and the full half of the produce for expenses. These proportions differ vastly from the ratios which now obtain between the landowner, the farmer, and the expenses, in which the former gets from a fourth to one-half of the gross produce, or one-third in the average, and the farmer is left with two-thirds for himself and the expenses. The landowners now-a-days would look very shy at one-tenth part of the produce for rent; and Tusser seems to have had no idea of the interest of capital, or of allowing for the farmer's time. He calculates only for the maintenance of the farmer, which in his time may have been all

that was expected from such employments as farming. The increase of population and of capital has completely overturned and reversed the arrangements of the primeval days of British agriculture.

At the early age of literature in which Tusser lived it was a grand conception of his mind to write agriculture in poetry, and dignify the art with that refinement. He probably thought to grace an art that has never been adorned, and also to build its palace in its verse—an idea that has never since that time occurred to the many would-be decorators of agriculture, but which may probably, in no great distance of time, be done in heroic verse by the writer of this biography, and thus join the company of Hesiod, Virgil, and Tusser.

METEOROLOGY, ITS CONNECTION WITH THE CULTIVATION OF THE SOIL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

At p. 3, vol. ii., of this widely circulating magazine, I had an opportunity of making a few remarks upon the intimate connection which exists between the meteorological phenomena of a district, and the modes of cultivating the soil which the inhabitants of the locality are induced to adopt. In this paper I propose to follow the branch of the inquiry which relates to the fall of rain, a little more in detail, before we proceed to other branches of an inquiry so vitally important to the skilful farmers of our islands.

There are a few general observations with regard to the depth of rain falling in different districts which appear to be applicable to most countries. For instance—the quantity of rain falling in hilly districts is, in general, much more considerable than in low-lying countries. In the level district of Egypt it rarely rains, although in the adjoining mountainous land of Abyssinia the rains are copious and frequent; at Lima, in South America, it hardly ever rains, whilst amongst the adjoining great mountain-chain of the Andes the rains are incessant. In England the driest counties are the level districts of Essex, Suffolk, and Norfolk—the wettest, the hilly county of Westmoreland.

The amount of rain which fell in 1850, in the level district of Chiswick, near London, was equal to a depth of (*Gard. Chron.*, 1851, p. 8)	18.28	inches.
In the same year at Whitehaven, in Cumberland, it was equal to (*Mr. J. F. Miller, Trans. Roy. Soc.*, 1851, p. 625)	40.473	„
At Gatesgarth, in the same district, 290 feet above the sea	108.84	„
At Seathwaite, in Borrowdale, 368 feet above the sea.....	143.96	„

The mean depth of rain falling in each month at Chiswick, during the 23 years, and at Applegarth, in Dumfrieshire, for the 20 years previous to 1848, was—

	At Chiswick.	At Applegarth.
January	1.59	2.60
February	1.95	2.04
March	1.36	2.35
April	1.47	1.76
May.....	1.84	1.69
June..	1.88	3.16
July.....	2.36	3.91
August.....	2.41	3.60
September	2.68	3.13
October	2.56	3.56
November	2.56	3.60
December	1.58	2.94

Rain-drops vary in size from about the 25th of an inch in diameter to one-third of an inch. From 25 years' observations made at Greenwich (from 1815 to 1839) by Mr. J. H. Belville (*Manual of Barometer*, p. 33), it appears that the greatest average quantity of rain falls in October, and the least in February—the heaviest rains being those of the summer (when an inch and a-half will sometimes fall in an hour) and early autumnal months, whilst in the winter that quantity will occupy many hours in falling. The average depth of a winter-day's rain seldom exceeds one-tenth of an inch per hour. A fall of snow is equal to one-tenth of its depth of water. In the following table by Mr. Belville, of the Greenwich Royal Observatory, column I. gives the month; II., the average monthly fall of rain, in inches; III., the greatest quantity of rain recorded in one month; IV., the least recorded uantity. The average of the year, at Greenwich, is about 25 inches.

I.	II.	III.	IV.
January	1.57	4.833	0.30
February	1.56	3.690	0.04
March	1.71	3.450	0.40
April	1.83	4.790	0.06
May.....	2.01	4.160	0.50
June	1.91	4.260	0.59
July.....	2.41	6.650	0.10
August	2.33	4.655	0.07
September	2.50	4.795	0.65
October	2.52	5.070	0.53
November	2.49	4.330	0.85
December	2.25	4.540	0.08

In considering the value and the quantity of rain, as Lord Lovelace truly remarks (*Jour. R. A. S.*, vol. ix., p. 330), we all know that the amount is of less consequence than the frequency of it, and the periods over which it is spread. At Lancaster, Penzance, and Truro, there are commonly 159.5 days in the year in which it rains; along the coast of France, 139.7; in Northern France and Germany, 144.9; Italy, north of the Apennines, 104.2; Southern France and Italy, 91.2 days. The average fall in a rainy day in England is ·2322 inch; in Western France, ·2122; Northern France, ·1847; Northern Italy, ·3853 inch. At Paris, the mean of the intervals between rainy days, as for the whole year, is 4 days; at Orange, 4.6; at Niccolosi, in Sicily, 10.8 days. From some observations made on the rivers Volga and Elbe, it had been concluded that as their depth of water was decreasing, so the annual amount of rain was less. As far, however, as can be inferred from registers kept in different parts of the continent, it is rather the reverse of this. For 100 years from 1689, the annual fall at Paris was 18.38 inches—during the last 40 years it has been gradually increasing: it is now 20.86 inches. At Milan, from 1763 to 1849, it has increased from 36.81 inches to 40.66 inches. In the valley of the Rhone, the mean of decennial periods has been—1787, 33.14 inches; 1797, 35.39; 1807, 36.45; 1817, 40.66 inches.

In order to ascertain the depth to which rain penetrates, M. Gasparin instituted some experiments, from which he concludes, that through a perfectly dry argillo-calcareous soil, in a state of fallow, rain descends in one day six times the depth of the quantity fallen. Thus a fall of 4-10ths of an inch will sink in a day through nearly 2½ inches.

In viewing the connection between the mean amount of rain falling in any district, and the general system of cultivation adopted by its farmers, the nature of the soil on which that rain occurs forms a very material portion of the inquiry, especially with relation to the power which those soils possess of absorbing and retaining moisture. This section of our examination may be conveniently divided into two divisions—First, the amount of rain-water which certain soils can retain without allowing any portion to escape by drainage; and, secondly, the relative rapidity with which they allow that moisture to be absorbed by the air, or evaporated by the conjoined action of the sun and winds. These are evidently facts of considerable importance, since it is evident that a soil, for instance, which in Cornwall or Devonshire would, in their moister climate, be deemed too retentive of water for the successful cultivation of the cereals, and fit only for the production of grass, in Suffolk or Norfolk would be deemed excellent corn-producing land; because there the fall of rain is so much less, and from the greater prevalence of drying winds, the evaporation so much greater at certain seasons of the year than on the western side of the island. The amount of water which a cubic foot of various soils can contain before they allow any of it to run off, was determined by M. Schubler (*Jour. R. A. S.*, vol. i., p. 184). He ascertained that a cubic foot of—

Siliceous sand held of water	27.3	lbs.
Calcareous sand.....	31.8	„
Sandy clay.....	38.8	„
Loamy clay	41.4	„
Stiff clay or brick earth.....	45.4	„
Arable soil.....	46.8	„
Garden mould	48.4	„

The relative degree of rapidity with which rain-water is evaporated from these soils, when exposed on a thin surface in a closed room, was determined by the same philosopher: he found that by exposing 200 parts of each earth in a temperature of 65¾ of Fahenheit, for 4 hours, that of every 100 parts of water absorbed, were lost from the—

Siliceous sand	88.4	parts.
Calcareous sand.....	75.9	„
Sandy clay.....	52.0	„
Loamy clay	45.7	„
Stiff clay or brick earth	34.9	„
Arable soil.....	32.0	„
Garden mould	24.3	„

The tenacity with which the later retained portion of the moisture resisted the drying powers of the atmosphere will be found in the following table, which shows the times required for 90 parts of water to evaporate from 100 parts of water contained in various earths, the temperature of the room in which they were placed being still 65¾. It required from—

	Hours.	mins.
Siliceous sand.....	4	4
Calcareous sand.....	4	44
Sandy clay	6	55
Loamy clay.....	7	52
Stiff clay or brick earth.....	10	19
Arable soil	11	15
Garden mould.....	14	49

There are other valuable facts connected with the retentive nature of soils, which are too important to be discussed at the conclusion of an essay; these, therefore, must form the subject of another and separate inquiry, in which I propose to accompany the inquiring English farmer.

GRASS LANDS.—HAY.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, ETC.

The extraordinary seasons of the present year have produced corresponding effects; and these have induced me to write on a subject which might be supposed to possess little interest from any new facts which could present themselves. However, it may prove otherwise upon the review of past and present circumstances. During a portion of January a very considerable quantity of rain fell, and to an extent which produced injurious floods in some localities. February was a fine month, with little of the usual falling weather, no snow, and scarcely any frost. But March was consistently dry, from beginning to end; affording a complete contrast to the corresponding month of 1851. If the reader refer to the meteorological diaries of this magazine, he will not be at a loss to determine the fact that the actual state of the weather to the last day of June has been so peculiar and anomalous, as to defy any attempt to discover a parallel within the preceding half-century.

To say nothing of the season for spring corn, and restricting our views to the grass lands, the farmer might be something to this effect—What question which naturally suggested itself to the hay must result from an almost unremitting continuance of a parching, easterly wind, with many frosty nights—from the 2nd of March, to the 27th of April inclusive (above eight successive weeks), during which there were only four days when any rain at all fell? But this was not all: dry and sunny weather continued till the 25th of May—relieved only by a few showers at the end of April, and the gentle and little penetrating rains about the middle of May.

At that time the prospect of any thing like a crop of hay was almost hopeless: the seed began to form: the bottom or sward was green, but so thin that persons expressed despair of a hay season. The cereal grasses—even the hardy wheats were either so thin, poor, or tardy in growth (though still in a healthy condition) as to render it nearly certain that the harvest must be late.

The wind, however, went to the west and south-west on the 30th; rain approached on the 31st, and from that day to the end of June there were only three dry days. The temperature improved, but it was upon the whole below the estimated average. Some hay, of mixed rye and artificial grasses, began to be cut at the close of June, and finally was safely carried early in the present month, proving a far better crop than could have been expected. From what has been said, and by recurring to meteorological tables and the report obtained from provincial notices, it must be evident that the season has been *periodical* in its weather, and by no means fitful and changeable according to the wont of our variable climate.

July has always been considered the only month of the year which is visited by periodical rains; yet, in East Surrey, where I write with my diary before me, I find that not one drop of rain has yet fallen—that the atmosphere has been cloudless, the sun brilliant, and so powerful as to have brought the maximum temperature to 85 degs. and the average mean of nine days and nights at 10 p.m. to 73.3 degs.

Under these extraordinary conditions it is not surprising that the hay has been cut, made, and carried with great rapidity.

The general yield fell, doubtless, short of a good average; but so great was the influence of a bulk of rain during nearly five weeks, amounting to saturation, that a better return has been gathered than could have been anticipated.

Facts simple and bald as the above would scarcely have warranted the notice thus taken of them; but I have been induced by the peculiar nature of weather and its striking contrasts so to introduce the mention of a fine and inestimable crop of meadow hay that was cut, I think, on Monday and Tuesday, 5th and 6th, and ricked on the 8th. The meadow is one of ordinary pasture, on a strong, hard loam: under a former possessor, it and several acres adjoining did not yield together a corresponding crop. The present occupier, thoroughly versed in agricultural practice, made it his object to compare the fertilizing powers of the best home-produced stable and bone manure, and of *Peruvian guano* at £9 per ton.

He set apart a certain portion of the meadow for each. The guano was scattered before shutting up for hay—at the rate of 2½ tons per acre; of the weight of dung, I could not obtain definite information; but a preference was given to grass produced by guano—with this drawback however, that by a thorough and liberal manuring of manure more permanent effects were produced; whereas the guano acted only for one season. Another gentleman has now also a very heavy crop of grass by using superphosphate of lime: so I was assured, but had not opportunity to inspect the land.

It is evident that guano properly applied, if of genuine and sound quality, is an admirable manure for pasture grasses, as it combines the phosphate of lime in a state of infinitely minute division,

and with it ammonia as a saturating base of several acids, but it is deficient *in bulk* of those vegetable and animal substances which dung comprises, and which, I contend, are required by every kind of land, as containing the element that, during fermentation, develops those electricities that attend every process of chemical decomposition and combination. The subject is deep and mysterious, but it merits the utmost attention of our analytic philosophers. Still guano ranks as the very first of our comprehensive natural manures. It would repar the farmer for all his sacrifices could he obtain it *pure* at £5 or £6 per ton; and any government which pretends to do justice to agriculture, and yet could neglect to overlook the importance of the guano question, in all its legitimate bearings, would have little claim on the confidence of the country.

July 10th 1852.

(Heat at this afternoon 79 degs. to 80—in the night 63 degs.—brisk lively air and powerful sun.)

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

THE STONE QUARRIES OF SWANAGE.

Letter XXVIII.

(From the Morning Chronicle.)

Before proceeding to describe the condition of the agricultural labourer in the counties forming the south-eastern angle of the kingdom, it may not be amiss that I should present the reader with a brief account of the quarries and quarriers of Swanage. Such a task may appear to be somewhat episodical in a series of communications having more especial reference to the state and circumstances of the agricultural labourers, with whom the parties in question cannot properly be classed. But if they cannot be strictly so classed, it requires no very great latitude of construction to bring their occupation within the category of labour in the rural districts. It is only thus that, like the miner and the fisherman, they can be brought within the range of the present inquiry; whilst their singular position, peculiar habits, and antiquated fashion of transacting business, render them more interesting as a study than even the laborious excavator in the mine, or the hardy adventurer who braves all weathers in pursuit of the mackerel, the herring, and the pilchard.

A little to the east of St Alban's Head the coast of Dorset treads suddenly in a northerly direction. From the north side of the entrance to Poole Harbour it makes again to the eastward, stretching towards the Isle of Wight in a waving line, that terminates with the long point of sand, on the extremity of which, commanding the entrance to the Solent, stands the historic fortalice of Hurst Castle. The town of Swanage, which is in the bight of Swanage Bay, is situated about midway between St. Alban's Head and Poole Harbour, having thus an easterly look-out, with the Isle of Wight visible in the distance, when the day is at all clear. The district of high land which rises abruptly behind the town, and stretches back for some miles in the direction of Corfe Castle and Kingston, is also known by the name of Swanage. This district comprises the stone quarries in question.

On approaching Swanage from the direction of Studland, the whole district behind it, sloping rapidly up from the sea, presents to the stranger the appearance of one huge rabbit-warren. It has a varied aspect, from the surface being in some places tolerably well cultivated, and in others still covered with down. But what strikes one most is the number of holes with which it appears to be perforated, and the quantity of rubbish which has been thrown up in the immediate vicinity of each. These are to be seen, in all directions, scattered not only over the face of the downs, but also amongst the fields which have been enclosed and cultivated. They impart to the district the singular appearance alluded to; and the stranger, ignorant of its real character might, on approaching, fancy it a spot in which game of all kinds had enjoyed a succession of jubilees, ever since the establishment of the New Forest itself.

But these are far from being the tokens of the abandonment of the land either to game or vermin. They are the signs of busy industry, the results of the toil of generations of honest and hardworking men. The chief value of the district is not in its surface, but in that which is beneath. The holes which so thickly stud the hill side are the means by which the quarriers get at its hidden treasures. The small mounds beside the holes consist partly of the produce of their labours, and partly of the debris which they necessarily accumulate in the conduct of their operations.

The district in question is part and parcel of the Isle of Purbeck, so long celebrated for its marble and its different varieties of stone. The most southerly of the chalk ridges, which dips into the sea at the Needles, emerges from it again at the point known as Old Harry, immediately to the north of Swanage —this point, indeed, forming the northern boundary of the bay. From this point it proceeds inland towards Corfe Castle, stretching towards Dorchester and the borders of Devon, near which some of its spurs again dip into the sea. The strip of land lying between this chalk ridge and the Channel, and including Swanage, the greater part of the Isle of Purbeck, and the whole of the Isle of Portland, is rich in sandstone, and here and there in that peculiar species of marble which has entered so largely into the ornamental part of our ecclesiastical architecture. About Swanage and the Isle of Portland, the sandstone comes near the surface, and is easily quarried. Proceeding northward from the coast, it soon dips under the chalk—where, of course, it cannot be worked.

Swanage has long been celebrated for its quarries

and its quarriers. Almost from time immemorial has stone been extracted from the hills which sweep around the bay, until now the whole country, for miles back, is so perforated and undermined as to resemble one huge catacomb. From the earliest period, too, the quarriers have existed as an organized body—bound together, not only by the tie naturally created amongst those engaged in common pursuits, but also by a number of ancient and revered articles, which they have invariably treated as a charter of incorporation. Indeed, for centuries they were known in their corporate capacity as the Company of Marblers. They still retain the articles, to which even to this day they pay especial reverence, and they still keep up to some extent the organization of former times. That to which they now cling, however, is more the form than the substance of bygone privileges—the skeleton of their organization being still perfect, although the flesh and muscle have long since dropped away from it. But much as the general objects of the original association have been departed from, there are still some points in respect to which they are to this day rigidly enforced.

Originally, the body of stone quarriers constituted a species of copartnery—each member being interested in the profits, and liable, *pro rata*, to make good the losses of the body. When such was the case, wardens were annually elected, under the articles, whose business it was to exercise a general supervision over the interests of the body, to dispose of the produce of its labour, and divide the proceeds amongst its members. The wardens thus chosen by the quarriers were invariably members of their own body; and during their tenure of office they were relieved from all duties, except such as pertained to the post which they were called upon to fill. Some of these are still performed by the wardens —for, to the extent of electing these ancient officers, at least, the old organization is still kept up. They are not, however, so numerous now as formerly, for the simple reason that their duties are more limited. The number now elected does not exceed two, who with the secretary (whose position is permanent), constitute the entire official staff of the body. The quarriers have still common interests to watch over and promote; and in the furtherance of these they still act in their united capacity. But the general partnership of past times no longer exists —each, so far as his labour is concerned, being at liberty to promote his own individual interests, whilst it is competent for as many as please to unite in groups for the same object.

One of the main objects of the original association was to secure a monopoly of the quarrying trade of the district. To effect this it was made one of the articles that none but such as were made free of the company should be permitted to enter its works, or to have any share whatever in the business which it pursued. As it scarcely ever happened that any were made free of the company but the children of its existing members, it followed that strangers were effectually excluded, and that the business of stone quarrying, in that neighbourhood at least, remained a complete monopoly in the hands of a certain number of families. If antiquity be an essential element of true nobility, there are families at this moment in Swanage, with unbroken genealogies, extending back far beyond those of half the nobles in the realm. One can understand both the institution and the jealous maintenance of such a provision, so long as the whole body constituted one company with common interests and liabilities. But now that the partnership is effectually broken up, and the business is pursued individually, and not as a corporate concern, it may be easier to account for, than to justify, their continued adhesion to the rule for the exclusion of strangers from the quarries. They themselves have free warren of the wide field of competition around them, of which many of them, impatient of labour in the quarries, take advantage, and obtain employment in the metropolis, or wherever else Government works may be in progress—for it is generally to these that they flock. Should they tire of this, or should occupation elsewhere fail them, the quarries at Swanage are open to them on their return—for "once a quarrier always a quarrier" is the rule. It is this that renders so invidious their jealous exclusion of the stranger from their own peculiar field. They avail themselves of the right to compete with him on his ground, but will not suffer him to meet them on theirs. They have, of course, no legal right to exclude him. Any man who chooses may, if he can get a lease from the lord of the soil, take a quarry at Swanage, and work it. But there are a thousand ways in which they could annoy him and put him at a disadvantage; and to remain, under such circumstances, for any length of time amongst them, a man would require to be possessed of some means, and of an uncommon stock of fortitude. They are particularly jealous of the Portland men, who, on the other hand, are equally jealous of them. If a master-quarrier employs any stranger in his quarry, he is liable to a fine of £5—the mode of exacting which will be afterwards alluded to. In some cases there might be a mitigation of the penalty, but the fine would, in all instances, be inflexibly enforced if the interloper could be traced back to Portland. Indeed, the rule is, never to remit, and seldom to mitigate, the fine —a knowledge of which on the part of the quarriers generally renders the necessity for its imposition a matter of rare occurrence. An amusing instance of the extent to which the jealousy in question is carried, and particularly as regards strangers of their own order elsewhere, was related to me by a Swanage man who had attempted to smuggle himself into the quarries in Portland. When they find a stranger at work in the latter place they generally permit him to work for a week, at the end of which time they presume that he has earned enough to carry him out of the island. They then, when circumstances will admit of it, present a very ugly alternative to him—namely, to walk a plank, partly projecting over a cliff, or to quit Portland, never to return to it. My informant told me that, for the first week, he was treated with every possible consideration; indeed, he could not conceive of greater kindness than that which he experienced, particularly from the man who worked next to him—"Yet that was the very man who laid the plank for me when the week was out," said he; giving me to understand that the alternative alluded to was then quietly, but

seriously, offered to him. As a sensible man, he preferred quitting the island to walking over a cliff into the sea. "And would you serve a Portland man in the same way?" I asked him. "Well, I am not sure that we would," he said; "but we would lead him such a dog's life of it, that he would soon be glad enough to be off." The system of exclusion is, perhaps, not now so rigidly adhered to in Portland as in Swanage—the Government works which have recently been carried on at the former place having tended, more or less, to break it down, from the large and constant influx of strangers which they have occasioned.

A quarrier cannot be made free of the company until he is twenty-one. He may be apprenticed at any age at which he may be found capable of working; but at whatever time that may be, his probation does not cease until he comes of age. It is to his father that he is generally apprenticed, or, if the latter is dead, to his nearest male relative, being a quarrier. It is not necessary, however, that the master should be at all related to the apprentice. It is to the father, however, that in the great majority of cases he is apprenticed, the business regularly descending from father to son. Indeed, the veriest infants, when males, are generally treated by their parents as the raw material for future quarriers. The father is entitled to the whole profits of his son's labour during the entire period of his apprenticeship. Should the father die during the term, the apprentice does not necessarily become his own master. In that case, the mother's interests are provided for—she being conditionally entitled to the profits of his work until he attains the age at which he can be admitted a free man. The condition on which this right is secured to her is a very simple one, and one easily performed, being neither more nor less than the payment of a shilling into the funds of the company on the day of her marriage. This condition, which is within the reach of every couple, is almost universally complied with. The ceremony of admission takes place but once a year. The grand gala-day of the quarriers is Shrove Tuesday. On that day they meet at Corfe Castle for the admission of new members and the general management of their affairs, so far as they are still regulated in common. The apprentices who have completed their term, and are otherwise unexceptionable, are then admitted, and on payment of 6s. 8d. are enrolled freemen of the company, being thenceforth entitled for life to all the privileges which that honour confers upon them. On this occasion, the quarriers manage to combine festivity and amusement with business. I have already alluded to the condition on which the mother, in case of the father's death, is entitled to the son's earnings whilst he remains an apprentice. The last couple married during the year have to provide a foot-ball, which is regarded as tantamount to the shilling paid by others—the woman who provides the foot-ball being entitled to all the privileges of those paying the shilling. As soon as the young men who are found qualified have been admitted and enrolled members of the company, they are sent out to amuse themselves with a game at foot-ball, in which they very heartily engage. The articles of the company, some of which are supposed to date back as far as the reign of Richard II., are then read by the secretary to the seniors, who remain in conclave behind, the newly made members not being admitted to so great a privilege until the following year. If there are any matters of general interest to be talked over they are then discussed, after which the elders adjourn to join the young men at their game. The festive board is not a feature overlooked amongst the ceremonies of the day, which generally, however, to the credit of those concerned, closes without riot or disorder. Such is the principal ceremony enacted at these annual meetings—a ceremony which has now reference more to the commemoration of past privileges than the maintenance of present ones.

The secretary is a man of no little authority with them. The influence which the present incumbent of that office wields is more of a personal than an official character. His name is Webber. He is at present chief clerk and book-keeper in the office of the Messrs. Pike, formerly alluded to as the principal clay merchants in the neighbourhood of Wareham. His original occupation was that of a stone-mason, which he still occasionally pursues, during his leisure hours, by way of recreation. His labours on such occasions generally take a funereal turn—the carving of gravestones being his forte as regards the chisel. Having received some education in his youth, he has turned it to the best advantage; not only thereby improving his own position, but acquiring an almost unbounded influence over the body to whom he originally pertained. He is not only their chief official, but also their friend and counsellor. "Mr. Webber," they will tell you, "is an understandin' man. He knows more about us than we do ourselves. He keeps us all right. Whenever we get into difficulty we always go to he." To the qualities of the intelligent observer and shrewd man of business, Mr. Webber superadds some touch of the poetic fire, as the file of the *Poole Herald* can testify.

The quarriers are now divided amongst themselves into two classes—the master quarriers, and the ordinary quarriers, who give their labour for hire. This classification goes evidently no further back than the termination of their original arrangement, by which all the quarriers were upon an equal footing. The difference between a master and an ordinary quarrier is purely accidental—the two classes not existing as distinct orders amongst them. A master quarrier is he who takes and works a quarry; and there is nothing to prevent an ordinary workman from taking a quarry if he pleases, and if the lord is willing to give him a lease. Many of the quarries are taken and worked by a single quarrier, all the aid which he receives in his operations being in the shape of hired labour. In other cases, several join together in a kind of partnership, working a quarry between them—being sometimes employed alone, and at others having hired labour in aid of their own. When one or more intend to take a quarry, the first thing to be done is to obtain a lease from the lord. This is generally granted without much difficulty, the lessees selecting their own ground, unless some good reasons exist for confining them in their choice. By the terms of

the lease the landlord becomes, as it were, a partner in the adventure; his rent depending, as to amount, upon the quantity of stone yielded by the quarry. At Swanage the stone produced is generally of two kinds—the solid block and the flat paving stone. The lord's dues are regulated by the number of superficial feet excavated in the one case, and generally by the number of cubic feet excavated in the other. They amount to a shilling for every hundred superficial feet of paving, and the same for every hundred cubic feet of solid stone. The lord has thus an interest not only in the goodness of the quarry, but also in the industry of the quarriers. One of the conditions of the lease, therefore, is, that the quarry shall be worked—a condition sometimes only complied with as regards its letter, when it is not the interest of the lessee or lessees either to work it constantly, or to give up the lease. It is seldom that anything in the shape of a written document passes between the parties, the leases having been verbal ones from time immemorial. And when a lease is once granted, the lessees cannot be dispossessed so long as they comply with the condition already alluded to. As to the scene of operations, too, they are only limited as regards the shaft; but, having sunk the shaft at the point selected when the lease is granted, they are at liberty to work under ground in any direction they please, and as far as they please, provided they do not transgress the bounds of the landlord's property, nor come within a hundred feet of another quarry which is being then actually worked. If they go beyond the bounds within which it is competent for the landlord to license them to work, and trespass upon another man's land, the party thus aggrieved has his remedy, as in ordinary cases. If they go within the forbidden distance of another quarry, the parties whose rights are thus invaded look not for their remedy to the law of England, either common, statute, or ecclesiastical, but to the code peculiar to the locality, and which may be designated as Swanage law.

For amongst the other peculiarities of this singular district, it must be borne in mind that its people have their own code of laws, and their own mode of giving them effect. It is possible, no doubt, theoretically, that an English writ might issue into a Swanage quarry; but English law has, generally speaking, very little to do with the practical administration of Swanage justice. When a party is suspected of trespassing in the manner alluded to upon the rights of his neighbours, a meeting of the whole body is called, by whom the accusation is heard, and if a *primâ facie* case is made out, a deputation is appointed to descend into the quarry and examine into the real state of the case. This deputation is not a mere committee of investigation, whose simple duty it is to inquire and report—for it is contingently armed with administrative powers, which it is enjoined to put in force, should such a course be necessary, to do justice between the parties. Thus combining ministerial with judicial functions, the deputation descends into the quarry, provided with compasses and other appliances necessary for ascertaining the truth. If there is no ground for the accusation, the charge is dismissed, and the matter goes no further, unless the accusation be repeated; but if there is ground for it, and a trespass has actually been committed, a fine is imposed upon the delinquent party, according to the extent of his transgression. If the trespass is one which is likely to be persevered in, it is the business of the deputation to take such steps as to render it impossible that it should be so. To effect this, it is armed with very summary powers, which it invariably exercises whenever a necessity arises for putting them in force. The mode of proceeding in such case is to destroy the portion of the quarry in which the offence is otherwise likely to be continued. This is done by breaking down the roof, or otherwise destroying the "lane" or level from which the stone is being excavated. When this process is not likely to answer the purpose, or when its execution might be attended with considerable risk or trouble, the end is more speedily effected by walling up the lane with mason work, and thus preventing the delinquent from having further ingress into it. It is seldom that the offence is repeated after this, at least in the same direction; for the culprit is not certain that, should he again be caught trespassing in the same quarter, he himself might not be walled bodily in as a warning to others. So tenacious are the quarriers of the privileges which remain to them, that I am not sure that public opinion in Swanage would not sanction such a mode of procedure with one who should prove himself incorrigible in their infraction. One reason for enforcing the rule in question is that, if they approached nearer each other, they might mutually endanger the stability of their works, as will be seen when their mode of working is described.

For all purposes of action as a body, their organization is essentially democratic. They settle nothing by delegates—all matters of common interest being canvassed and determined in their primary assemblies. It is only when the time for action comes that they delegate their powers. Whenever a question arises which it is necessary for them to settle, the two stewards or wardens of the body go round to all the quarries—not exactly with the fiery cross—but with a notification to all the members of the body to attend a general meeting thereof at a time and place then mentioned. Nor is this a notification to be disregarded with impunity, the attendance being compulsory. The absentee, unless detained by sickness or other unavoidable cause, is liable, for non-attendance, to a fine of 3s. 4d.; and this being more than the average value of a whole day's work, it is seldom that any who can attend are absent for the sake of gaining half a day, which is the time usually occupied by such meetings. The place of meeting is generally the neighbourhood of some well-known quarry in as central a position as possible. At the mouth of most quarries there is a capstan used in drawing the stone out of the mine. The meeting is constituted under the presidency of the session warden, whereupon the business of the day is immediately entered upon. The assembly is usually addressed from the capstan, which is mounted by the different orators in succession. Sometimes the utmost order is preserved; at others, the assembly

is somewhat disposed to be disorderly. "At times, sir," said one of them to me, "they do be all talking at once, except the warden, who keeps all the time calling 'silence!'" The matter, whatever it may be, being fully laid before the meeting, the next thing to be done is to come to some resolution respecting it. That being attained, the last business of the meeting is to devise the means of carrying its resolution into action. When the case is one of trespass, the mode of procedure is generally such as has been already described. When the body is called together to adjudicate upon the case of an interloper, the master-quarrier charged with having employed him is regularly put upon his trial. Should he be found guilty, he is condemned, as already intimated, to pay a fine of £5. Should he afterwards refuse to pay the fine, another meeting is convened, at which the whole matter is re-heard—when, if the former judgment is affirmed, the power of levying the fine, per force, if necessary, is delegated to a certain number of the body. These, after having given him sufficient time to reconsider his determination, proceed, if they find him still contumacious, to his quarry—and, without further warrant than the behest of the tribunal which appointed them, seize all the stone they can lay their hands upon, to the value of the fine imposed. A more lawless proceeding can scarcely be imagined—rendering, as it does, every man engaged in it liable to a civil action at least, if not to be criminally indicted, for the part he takes in it. Yet it is generally regarded in Swanage as one of the ordinary channels through which justice takes its course. Again, the body may be called together to consider respecting some real or fancied invasion of their privileges, or some nuisance which may have been instituted to their injury. The question then to be determined is, whether they will resist the innovation or abate the nuisance? If the case is one which admits only of passive resistance, the result is a simple resolution to resist; but if it is one calling for active measures, the means for taking them are immediately provided. It is but a short time ago since a case of this kind occurred. The grievance assumed the double aspect of the invasion of a right, and a positive nuisance. The offending object was neither more nor less than a weigh-bridge, which had recently been established upon a road over which the quarriers had long enjoyed the right of conveying as heavy loads as they pleased. They looked with the greatest suspicion upon the appearance amongst them of this appliance of civilized life, and immediately summoned a meeting to canvass its nature and consider its tendencies. The one they soon determined to be at least suspicious, and the other to be indisputably bad; so they resolved, by one and the same act, both to vindicate their right and abate the nuisance. The course determined upon was the very energetic one of demolishing the weighbridge, to effect which an executive commission was extemporized on the spot. This commission, armed with sledge hammers, was proceeding in the most orderly manner to the execution of its duty, when it was met by the *merchants* of Swanage—a set of men who will be afterwards alluded to—who did all in their power to divert it from its purpose. But all their entreaties were of no avail, until they at length pledged themselves that the offending object should be removed. On this the commission desisted, and the weigh-bridge was afterwards removed. The quarriers thus carried their point, and to this day they convey their loads over the road in question without being subjected to the annoyance of having them weighed, and of virtually paying a double toll—one for passing through the gate, in the neighbourhood of which the obnoxious machine was placed, and the other for the purpose of weighing. This may suffice to show how primitive is the state of development which society has as yet reached in Swanage.

(To be concluded in our next.)

PLAN OF FARM BUILDINGS.

BY MR. CHAS. P. TEBBUTT.

No. 196, Class 9, in the Exhibition, is a model of a farmstead for 250 or 300 acres, by Mr. Charles P. Tebbutt, of Bluntisham, Huntingdonshire. It comprises stabling for 10 horses, well-sheltered yards for about 40 beasts, cattle-boxes for fatting cattle, cow-house for 6 cows, pigsties, &c. The designer is probably known to many of our readers as the author of an interesting article on farm buildings, in the 11th volume of the Royal Agricultural Society's Journal.

GENERAL REMARKS.

In this design the principal objects kept in view have been

To secure for all the cattle yards the best possible position.

To provide a fair number of loose boxes for fatting cattle and cows, well arranged with relation to the food-preparing place.

To provide a stable ample and convenient for the farm horses, with sliding doors to stalls, so that the horses may lie loose at night.

To arrange the buildings generally in such a way that they may be conveniently placed, having regard to their relations to one another.

To obtain these advantages at a moderate cost.

Fixed steam threshing machinery should be placed in or near the east end of the present barn, when it will be conveniently situated with regard to chaff-cutting and the grinding-house.

ESTIMATE OF COST.

	£	s.	d.
227 yards cube digging foundation, at 4d.	3	15	8
52 1-12 rods superficial reduced brick-work, at £6 10s. per rod	338	12	0
152 3-10 squares roofing (woodwork), at 25s.	190	7	6
150 3-10 slating (including ridge), at 23s.	172	16	11
516 yards brick flooring, at 1s.	25	16	0
47 doors, at 30s.	70	10	0
28 boxes, fittings, at 30s.	42	0	0
Stable fittings	20	0	0
Granary floor and fittings	20	0	0
Barn-doors (sliding)	10	0	0
Sundries, including front gates, spouting, lead for pipes, and valleys, &c.	106	1	11
	£1,000	0	0

THE PRESENT POSITION OF THE SHEEP FEEDER.

The question for stock-feeders used to be, how to raise the greatest possible amount of pounds of animal food per acre at the least possible cost. But somehow or other the question, as regards sheep at least, has assumed a somewhat new form. The time was when the largest and the fattest sheep commanded the best price. To take a small and not over-fed joint of mutton into one of the large towns of Yorkshire or Lancashire—to Birmingham, Wolverhampton, or Leicester, was to run the risk of having the commodity neglected. But now it is different. The half-bred Scot or the Down, or at least half-Down, is the only kind of mutton which will meet a market.

The time was when a large joint of *fat* mutton was put over a dish of potatoes. The meat went to the head of the family; the potatoes, saturated with the fat and gravy, were the savoury meal of the junior members. Thousands in the manufacturing and mining districts have for years been brought up in this way. But now they will have the small fleshy joints, with less fat; or they will buy them at an inferior price. The feeders of the larger kind of sheep are therefore in a worse position. The "good sheep"—once the favourites—from 22 to 28 lbs. per quarter, have now to go a-begging, and the feeder of small half-bred animals gets almost as much money for his once-despised but now fashionable breed.

This will soon tell on our best breeds; and it will cease to be an axiom that it is an advantage to gain the most pounds of food at the least cost; but it will be the production of that kind of food which will realise the best price, and therefore *peculiar* rather than *good* quality will be the desideratum, and the demand will cease for beauty and symmetry, for early maturity and disposition to feed, and will run wild after the ungainly forms of black and grey faced "rannocks," setting defiance to domestication and low fences. Those who wonder what could be the object of the high banks of Norfolk, and the hedges at the top, will be succeeded by men who wonder what men could mean by such low and useless fences as disgrace all our newly improved farms. The facts of the case are beyond dispute. We will suppose a farmer purchasing a score of the Leicester and Cheviot hogs at the same period, feeding them the same time on the same food, and the results will be somewhat as follows:—

20 Leicester hogs, at 33s., bought in spring.				£33	0	0
Then say 7 lbs. each of wool, at an average price of 1s. 1d. per lb., 7s. 7d. each, or	£7	13	8			
Sold off fat, say at Christmas, weighing 24 lbs. per quarter, at 5d. per lb.	40	0	0			
				47	13	8
The 20 sheep will leave for food and profit				£14	13	8
20 Cheviot hogs, at 20s.				£20	0	0
Then say 3 lbs. of wool each, at 1s. 1d.	£3	5	0			
Sold off fat, 18 lbs. per quarter, at 6d.	36	0	0			
				39	5	0
The sheep will leave for food and profit				£19	5	0

Nor is this all. The case may be put in a much stronger light. The Cheviots and half-breds will live and thrive on a poorer quality and smaller quantity of food. And why? Because the taste will not allow them to be fed so fat. It is old flesh or muscle, small joints and light fat, which is the real desideratum in the manufacturing towns where the great bulk of our sheep is disposed of.

And a still further and more important view may be taken of the question:—More sheep per acre may be fed, by one or two animals, on the same land, of the one than of the other.

Thus we have smaller capital employed, less risk, more kept, inferior pastures stocked, a more ready market and greater profit by the fattening of those which were once considered the inferior breeds of sheep. Public taste in the shape of appetite, and public taste in the matter of symmetry and beauty, are at variance; but the former will triumph, for it will pay the best.

To the breeders of Leicester and of the sheep peculiar to Lincolnshire, called improved Leicesters—to the Cotswolds, and all that class of sheep, this is a "heavy blow and great discouragement." The pains and care and struggles of centuries are being set aside by the luxurious tendencies of our manufacturing population, and we hardly see our way clearly as to what they can do. It was hoped that when the alleged cause of the change—the failure of the potato—had passed away, the people would return to their old habits; but, as Sam Slick says—"Once accustom a man to a luxury, and he is done—you will never get him to give it up."

The potato is at least cheaper and more plentiful, but the large, fat mutton is not returned to: it still sells at an inferior price, and we fear it is likely to do so.

What are the breeders to do? There are two classes—those who breed *pure*, and those who breed crossed animals. The former are the best men of the day in showing fine specimens: they cannot change shape and quality—a beau ideal is before them, and woe to him who violates it! But they must adapt themselves. They might at least have a smaller animal—they must sell him before he gets so fat. Their breeds will be mature young—they must sell their hogs at one shear, and by rapid changes adapt their animals to the wants of the market.

But to those who are less scrupulous, a cross with a Southdown—the ewes being of the latter, and the ram of the Leicester bred—will produce a very marketable cross. A Bamboroughshire compact ewe, with a Cotswold ram, we have not seen bred, but we venture to predict a useful and saleable cross.

And let the breeders of the northern breeds look out to improve symmetry and beauty by judicious and patient selection. Why not always breed from the best? Why not buy the gimmers and hire the rams, which won the Highland Society's prize, for a few years, and make the old despised north sheep symmetrical?

Though there is every probability of the most favoured kinds of sheep, as they have been viewed of late, going downwards in public estimation, because they did not grow the kind of mutton which sells best in the market, yet still all our great Agricultural Societies adhere to them as the best kinds—the Leicesters are at the head of every prize list; and though the great improvements in the South Downs have given them of late a much higher range in public estimation, and they are supposed to be a local rather than a general breed, still they are gradually advancing in public favour. Mr. Lawes instituted a series of inquiries as to the abstract food and increase in weight of these sheep in themselves, and also as compared with the *Hampshire Downs*, assuming the Sussex Down to be the type of the original South Down sheep. The latter is the sheep of Mr. Jonas Webb, R. Ellman, and the Duke of Richmond: the former is a heavier frame and larger weight—is a fatter and more early mature sheep than the latter.

The two varieties may therefore be considered as a type of the small and the large sheep, and Mr. Lawes made several experiments as to the food and increase of each.

One disadvantage was that they had to be fed on dry food—they had oil cake and clover chaff. At first they had food supplied in given quantities, and proportioned to their weight; the quantity given per day to the Hampshires was one pound of each—while to the Sussex Downs it was only ¾lb. of each per day. The former weighed 113¾lb., and the latter only 88lbs. Swedes were also given *ad libitum*, but from quantities previously weighed. The sheep were fed for 26 weeks; the Hampshires consumed 1249lbs. of oil cake, 1120lbs. of clover hay, and 16,995lbs. of swedes, and the increase of live weight was 428lbs. So much for the large sheep. The smaller or Sussex Downs in fact consumed 965lbs. of oil cake, 926lbs. of clover hay, and 12,445 of swedes, and gave an increase in live weight of 324lbs.

To put it in a more striking light, it required to produce 100lbs. increase in live weight, the following quantities of each kind of food in the Hampshires:—

	lbs.	oz.
Oil cake . . .	294	0
Clover hay . .	259	12
Swedes	3941	0
Or a total food of all kinds	4494	12

Whereas the Sussexes required, to produce 100lbs. live weight, the following quantities:—

	lbs.	oz.
Oil cake . . .	314	4
Clover hay . .	304	3
Swedes	4086	0
Or a total food of all kinds	4704	7

The Sussex sheep required therefore in 26 weeks, 20lbs. 4oz. more oil cake, 44lbs. 7oz. more clover hay, and 145lbs. less swedes, to produce 100lbs. live weight, or about 7 per cent. more oil cake, 17¼ per cent. more clover, and 3⅝ per cent. more swedish turnips, for the same result. The taste indicated a difference in the animals: the Sussex sold at about 3s. 2d. per stone of 8lbs., the Hampshire only 2s. 10½d. per stone; and after paying their way, and allowing for the purchased food, the cake and hay, the forty Hampshire sheep left a profit, as well as the increase, of 6s. 7½d., and the Sussex of 6s. 0½d. per head. The oil cake is, however, reckoned at only £6 15s. per ton—a price we are afraid it seldom can be bought for—and the clover hay at £4. per ton. Nothing is charged for attendance.

As far, therefore, as this was a paying speculation, neither seemed to answer. The swedes, the attendance, the washing, shearing, and the other et-ceteras, would diminish the profit to less than *nil*, but this was hardly the object of Mr. Lawes. As an experiment it required that care and that control which it is not desirable to give in ordinary experience, and therefore ought not to be taken as an invariable conclusion; but it may go so far as to demonstrate

that it may not be always the best to drive too far the increase of artificial food.

The forty Hampshires consumed 49½ tons of swedes, and the Sussex only 36 1-10th. The latter were, however, much the smaller, and more would be consumed to the acre.

Mr. Lawes puts, however, the case in another light. He says, "Suppose then that in both cases 100 tons of swedes had been eaten, we should have had consumed with them, and paid for by the increase of the animal—

	Oil Cake, lbs.	Clover, lbs.
By the Sussex sheep . .	17,374 and	16,676
By the Hampshire . . .	16,470	14,767
	904	1,909

That is to say, in consuming 100 tons of swedes (and the dry foods), Sussex sheep would, according to our experiments, have given the increase from 904lbs. more oil cake, and 1909lbs. more clover than the Hampshires. To have consumed the quantities of food supposed above, however, in 26 weeks, there would have been required 80 Hampshire and about 110 of the Sussex sheep." Now this is what we placed as the real position of the sheep feeder in the previous part of this article. The larger sheep make more flesh, from a given area of ground they consume less food for the mutton and fat they elaborate and deposit, but being worthless per pound it is really an advantage in money matters generally to graze the inferior kind as regards the production of fat and mutton.

Though the cases experimented upon by Mr. Lawes do to a certain extent make out the principle we laid down, still it admits of exceptionable features. The large sheep are in the north the improved ones: it is the reverse with the Downs, the small are the improved. And this only strengthens our position. It takes the Sussex Downs out of the category of unimproved breeds, and thus places the smaller sheep in a position of undue advantage.

It is a very serious question, will the farmer go on, and how long, growing an unpopular kind of mutton? Alas for the luxury of the age!—Gardeners' and Farmers' Journal.

FARM VALUATIONS.—CROYDON FARMERS' CLUB.

The secretary of some farmers' club in an adjoining county made out a quaint document the other day, professing to give a debtor and creditor account of the year's transactions. Were we engaged to make a "valuation" of the Croydon Club's doings, we should say the discussion of May 29th, on the tenure of land, was in itself an ample offset to the year's subscriptions, and the labour of attendance; for it has again brought before the public the system of half-dressings, &c., which is not so much a burden on land, though it is that too, as a monster-grievance on the tenantry in the southern counties—a grievance, too, of the very worst description, for like the traders' income-tax it falls with iron weight on the honourable man, whilst the cunning of grasping avarice frequently enables the dishonest occupier to make an enormous profit out of his unsuspecting successor. It is highly satisfactory to find that only one voice is raised in the Croydon Farmers' Club in defence of the system of charging for half-dressings, &c.; and though we could have wished that that was the voice of a gentleman less able than Mr. Churcher, we cannot help thinking that an occasional loss had better be borne by the outgoing farmer—and this, we admit, must sometimes happen—than the constant heart-burnings and frightful wrongs which are the inevitable results of the present system. We cordially and heartily respond, too, to that which was the universal sentiment of the meeting, TO LET VALUATIONS BE BASED ON THE PRINCIPLE OF PAYING FOR WHAT CAN BE SEEN. Were that the principle adopted, we might not have to advertise so many farms to let; but we should be amply compensated by the increased prosperity of the southern counties, by the improvement of agriculture—the result of an actual enlargement of the tenants' capital, and by the consequent development of the resources of the southern counties.

In the absence of the Chairman (Mr. Page) Jonah Cressingham, Esq. (Carshalton), was unanimously called on to preside; Mr. Rowland (Coulsdon) being Vice-Chairman. On the motion of Mr. Churcher, Mr. Albert Stringer was unanimously elected a member of the club.

Mr. CHURCHER (West Wickham) then addressed the club as follows:—Mr. Chairman and Gentlemen,—I should not have presumed to bring forward the subject I am about to do, were it not for the diffidence of many members more able than myself to do justice to it, and better able to communicate their ideas than I can do; but I hope, gentlemen, you will see the justice of my views both to landowners and tenants, although you may differ from me on some points, and I hope every one will give his opinion on this important subject, viz.—"The best mode of letting and taking land for the encouragement of good cultivation." In the first place, I will briefly mention that everything in and on the land that is valued and paid for on entering, should be so on quitting; this, I think, every one will agree to; it is a subject of great importance as to the mode of valuing land (especially arable), so as to keep it in a good state of cultivation, both for the landlord, the tenant, and the prosperity of the country. I think a lease for 21 years is the best letting or taking, subject to leave at the end of the first seven or fourteen years by either party giving two years' notice, when a lease is not granted to hold under a three years' agreement to quit; and I would have the following as a basis:—

First Clause.—In valuing all the hay, straw, and haulm that is grown in the last year of the tenancy, to be valued at a market price. All the manure made in the last year, and all

manure brought on the land, in lieu of hay, straw, or green crops, taken off with sheep-folding, and making of fallows, to be valued at full price. All dressings, half-dressings, half-fallows, seeds (where there is a plant), leys, and underwood to be valued at their full value.

Second.—Pasture land not to be paid for in taking or leaving.

Third.—All the corn, chaff, cavil to belong to the outgoing tenant, with the use of the barns, and joint use of the rick yard, to the 1st of June, nine months after the end of the term.

Fourth.—The valuation to be paid for as soon as concluded, or on giving up possession; if not paid for then, interest to be paid on the valuation at 5 per cent. from the time of giving up possession.

Fifth.—In case the tenant should become a bankrupt, the lease or agreement to be cancelled, and everything to be valued and paid for the same as at the end of the term.

Sixth.—Corn or linseed-cake fed on the land the last year to be paid for at one-third of the cost price, if no crop is taken after; if one crop is taken off, then one-sixth of the cost price.

Seventh.—Tenants not to sow more than two white crops in succession; tares, beans, or peas not to be considered a white crop.

Eighth.—If tares, rye, or other green crops are fed off before the 25th of June; the fallow to be valued the same as clean fallow; but where cut or folded off the land, not to be allowed rent and taxes.

Ninth.—Landlords to put the house and buildings in good repair, and tenant to keep them so, by being found rough timber and materials within five miles of the buildings, by giving three months' notice in writing to the landlord. In case of fire, tempest, or natural decay (not through the tenant's neglect), the landlord to re-build forthwith.

Tenth.—The landlord to have the liberty to come on the premises when he pleases, or send his servants to inspect the state of repairs, and if any is wanted, to give three months' notice (in writing) that such must be done forthwith.

Eleventh.—Hares and rabbits to belong to the tenant; if not, landlord to pay the damage done by them (Hear.)

Twelfth.—Buildings erected by the tenant at his own cost, the landlord to have the liberty to take them at a fair valuation, or not, at his option; if not taken, the tenant to have the liberty to move them during the time he holds possession of the barns.

Thirteenth.—Tenant not to make less than ten acres of clean fallow out of every one hundred and not more than twenty acres out of every one hundred during the last year, such fallow to be sown with root crops where it is necessary.

Fourteenth.—Tenant to have the liberty to carry and sell off the land hay, straw, green crops, and root crops, by bringing back one waggon load of good dung for every 72 trusses of straw, or 36 trusses of hay, every half an acre of green crops, and every quarter of an acre of root crops, or for the tenant to spend as much money on artificial manures for dressing as he sells the hay, &c., for in the same year.

Fifteenth.—The tenant to give fourteen days' notice to the landlord before cutting any underwood: none to be cut under eight years' growth, or above 16 years.

Sixteenth.—Draining and chalking land best left to private arrangement; but I will merely suggest tenants to pay half and landlords half the expenses, and the tenant to pay 4 per cent. on the capital expended by his landlord. Such an arrangement would, I think, be fair for both parties; but if the tenant should leave in less than seven years, he should be paid one-half his outlay.

Under such a system I think the valuations of the majority of arable land would be about £600 for 100 acres; and half the valuation to belong to the landlord and half to the tenant. This would secure the landlord, and enable the tenant to have more capital and less lying dead; or on the other hand, all the capital might belong to the landlord, and the tenant pay a higher rent, amounting to four per cent.; or all the capital might belong to the tenant, and he would then pay a lower rent in proportion; but I think half the valuation to belong to each party would be the best. The landlord would secure a tenant with capital, and the tenant would have an interest in the land, and would keep it in good cultivation, and by so doing the produce would be increased; and when possession was given up, the valuation would be more for each party, and if the land was in worse condition the tenant would have less to receive, thus spending his own capital. But in many valuations, where the tenant holds under half a year's notice, or under lease with only one year's notice to quit, at the end of seven or fourteen years, and the labour on manure and feeding price for the straw and hay is paid for, it often falls with great injustice to a tenant on leaving, for if he leaves double the quantity of manure, hay, and straw, he is not paid for his improvement. On the other hand, if a tenant takes a farm with 600 cart-loads of manure on it, and only pays the labour on it, and on leaving there should be only 300 cart-loads with being paid the labour on it, there is an injustice done to the landlord. This mode of letting and valuing I think is therefore bad, and that it discourages good farming. There is one thing seems very preposterous to me, at many public meetings—the advising tenant-farmers to farm higher, and use more capital, when the government have passed measures to take that capital from them, and transfer it to other quarters. If the landlords were to tell the tenant-farmers at such meetings, that, as their produce was now selling at one-third less price, they would grant them fair covenants to farm under, and reduce their rents one-third, I think that would be much more encouragement to tenant-farmers, and not detrimental to landlords in the main; or else it is like taking a man and chucking him over a bridge, and saying "I wish you good luck" (a laugh). It is mere mockery. Where tenants paid fair rent seven years ago, there ought to be a reduction of fully 30 per cent. to enable tenants to keep their position and farm well; but if such is not done, I think good farming must—and will—degenerate from want of capital, under present prices. There are some who say "Leave your farm then, if it does not pay;" but I am one of those who will not easily be driven from the battle-field like a coward. I would sooner fight for the rights of the tenant-farmers than run; it is a calling I have been brought up to, and if I do not get £1 per cent. for my capital I will stick to it, and let our motto be "England for the English, and Englishmen for the Queen and Constitution" (cheers).

The CHAIRMAN thought they were much indebted to Mr. Churcher for bringing forward this important question. He believed that the time had arrived when it was absolutely essential that the nature of the agreements between landlords and tenants should be perfectly understood by both parties; and that as an important feature in their agreements the rela-

tions between the incoming and outgoing tenants should be carefully reviewed. It certainly should be the object of the landlord to aid the farmer in every possible way, and if in this case it could really be shown that whilst a considerable amount of relief might be given to the tenant, by a reform in the system of valuation no loss would be sustained by the landowner, the subject certainly did appear to demand their earnest and immediate attention (loud applause).

Mr. WALKER—In making a valuation for a tenant, I would have nothing included which I could not see. I think these half-dressings and half-fallowings give scope for all manner of fraud (applause). Let a man keep his straw and manure as he likes, and be paid for what he has by the incoming tenant. If you could get the landlord to lay down half the capital as Mr. Churcher suggests, it would be a capital scheme, if it did not lead to squabbling at the expiration of the tenancy, but the question is, would the landlord not say then, "You have not farmed as you ought." If the landlord thought he could get a good tenant, and knew he was short of capital, he could advance him so much on the lease, and that would prevent wrangling. As to allowing two white crops, I never take more than one.

Mr. CHURCHER urged that the valuer did see the half-fallows and half-dressings. Where seeds were sown, and they were clean, and fallowed with turnips the year before, the incoming tenant did see value for his money. As to capital lying dead, if out of the valuation of £600 on every 100 acres £300 belonged to the landlord, the tenant would have to make that good before he received anything, so that there was no reason for any document at all; for a tenant must surely leave his farm in half as good condition as he took it in.

Mr. WALKER: I took a farm subject to dressing and half-dressings. I said, there was no dressing at all about it; it was as poor as it could be. I said, "I see no tillage at all, and I object to these half-tillages." They said, there was so much manure here, and so much there, and they made out a valuation of £2,500, of which £500 were for half-dressings. I say, I would do away with all that; it is a perfect robbery. Let a man pay for all he can see and nothing more. Throw the dung in heaps, and the straw in stacks, and let the valuer go round and see it; but here the practice is, as soon as you can get it on the land to shovel it in, and then the valuers take the evidence of the interested party as to its value. All men were more or less selfish, and he would not lead them into temptation.

Mr. CHURCHER: You are subject to just the same robbery in your fallows and your dung the last year.

Mr. WALKER: I can't see it, and I don't want to pay for it.

Mr. CHURCHER: But you must pay for the last year, and I say, the valuers can see it the year before.

The VICE CHAIRMAN: I think Mr. Walker's proposition the best. If you take a farm very much out of condition, of course you have a right to say to the landlord, "You must pay me when I go out, as I paid you when I came in." But if I was landlord I would have none of these half-dressings. He would get more rent for his farm, and get a better tenant. If you go and look at a piece of seeds, where it was well done for turnips, and there was only one crop, a man who was a good judge would see at once a half-dressing; but in the valuation, practically, what did they find? A man would say, This was dressed and ploughed so many times, when, in fact, it was full of couch (Hear, hear).

Mr. WALKER: I find a poor worn-out farm has just as much valuation on it as one in very good condition. You all know the place I took. The valuation was £2,500 10s., and I would have defied any one to have got £1,000 out of it.

Mr. CHURCHER: Don't you think the valuation would be more now?

Mr. WALKER: No, I don't know if I left that I should get a shilling more.

Mr. CHURCHER: Yes, if you had more straw and more manure.

Mr. RICHARDS (solicitor), said that landlords were very fortunate now if they got £3 per cent. on any large purchase of land. In the West of England, a man could take as good a farm for £2,000 as he could here for £5,000, and generally speaking, he thought the man of moderate capital understood his business better than the tenant with a large one. The former was a practical man, but the man with £5,000 or £10,000 liked to enjoy himself, and employed a good bailiff. In Surrey, Kent, and Sussex, it had been the custom to have a large valuation, and the first thing to be done was to get rid of it. How was that to be done? Every tenant who left a farm was entitled to the same valuation as he paid on entering. You went in according to the custom of the country; the two valuers called in differed, and you were at the mercy of the third man, who too often decided by dividing the difference between the parties, so that one or other suffered considerably. Any alteration would find very strong opponents in the valuers; for were it effected, a portion of their occupation was gone. It was impossible now to leave a farm without employing a valuer; not so in other counties. Here the outgoing tenant tells his valuer he put on so much this year, and so much the year before; and when they went into half-dressings and half-fallows, the former, he would not say designedly, fancied he had put on, say thirty loads of manure. He had not taken any great account perhaps, not thinking he was going to leave, and he fixed on this as what he thinks near the thing. Then John or Thomas was called in, and the farmer says, "Do you recollect how many loads we put on Broad Oaks or some other field—it must have been twenty loads?" John, of course, says, "yes, it wur." The farmer went on, "and we ploughed that twenty-acre piece, when we finished this beadland, three times?" John thinks that's about it; the man gives way to his master, and down it goes as three times ploughing. He knew an instance where the man would not give way; these things were not wilfully done, but men fell into mistakes, especially when they did not mean to leave.

Mr. CHURCHER: But my agreement requires a two years' notice.

Mr. RICHARDS: That was a matter of private arrangement entirely. The landlord always appeared to him to let as advantageously to the tenant as possible; and he thought it would be the greatest benefit to these counties to get rid of the valuations altogether. Of course the landlord would have to pay every outgoing tenant for everything he had done on his farm according to his lease, for it was quite immaterial to the tenant whether he received it from the incoming tenant or his landlord. The landlord would know the amount of capital he had paid for that valuation, and he would find 20 tenants with £2,000 more easily than one with treble that amount. He would then charge the incoming tenant with so much for rent, including the valuation. It was like letting a farm tithe free; if there was no tithe, the rent was higher, and if there was no valuation to pay, the tenant must pay so much more rent. If a landlord bought up his valuations, and let his farms at an increase, say even of £4 per cent., the interest on that capital would pay him better than that invested in the land, because no landlord could buy land to pay £3½ per cent.; and no tenant could object to pay £4 per cent. on the valuation in addition to the rent now paid. It would answer his

purpose to pay even £5 per cent., because if he were enabled to apply the capital he would sink in the valuation to the purchase of stock; he would expect to get, and would get, more than £4 or £5 per cent. It was quite as much to the advantage of the landlords as the tenants to get rid of these valuations altogether. You would thus get rid of a great deal of suspicion and, not to say fraud, of a great deal of unpleasant feeling. The incoming tenant fancied, as Mr. Walker had said, that, if not cheated, he had paid a great deal too much.

Mr. WALKER; Well, I think I am.

Mr. RICHARDS: When a man saw a good yard full of rotten dung, and stacks of straw, he didn't object to pay for it; but he did object to pay for half-dressings and half-fallows which he could not see. If a man said he had put on 20 loads of rotten dung per acre, and he had sown seeds, and those seeds had missed, how was the valuer to know whether the dung had been put in or not. There was nothing to show whether the land had been properly cultivated or not. It was the same with turnips, and how often did they miss? What was there then, for the valuer to see to value? He must go entirely by the statement of the outgoing tenant. It was a very, very common case for seeds to miss, and the result must often be that the tenant paid for the cultivation of good crop of turnips, and, perhaps, there was not a ton per acre. If the incoming tenant paid at all, let him pay for the roots—let him pay for what he could see. The question required the consideration of both parties; and as to covenants generally they must be guided by the locality. He would not enter into those suggested by Mr. Churcher, but he was sure the present system was a complete bar to getting good tenants (Hear, hear).

Mr. STENNING felt very much obliged to Mr. Churcher, who had brought the subject forward in a most creditable way. He thought the first question was, what remuneration they were to receive for their cultivation. He hoped Mr. Churcher would not think him personal, but when he said he would take £1 per cent. on his capital rather than be driven out of the country, did he mean to say that he had made £1 per cent.? He (Mr. Stenning) could answer for himself that he had not (Hear, hear).

Mr. CHURCHER: I have not.

Mr. STENNING: Very well, then, if they were told they were not cultivating the land in the way they ought, he thought, after that reply from Mr. Churcher—and many others could say the same—they could hardly be expected to carry farming to the pitch of improvement desired. He quite agreed in the necessity for doing away with half-fallows and half-dressings; for there was so much deception and robbery going on in what you couldn't see, that even nine-tenths of the valuers themselves wished them done away with. They said, "We are obliged to take our clients' statements, though really they do not appear correct." Mr. Churcher said that he had provided for a two-years' notice; and he (Mr. Stenning) should like also to see the incoming tenant have the privilege of the control of the fallows, that the work might be done at proper times. We must all admit that, during a tenant's last year, he studied how to employ his horses to the best advantage, so as to make a valuation; and therefore he (Mr. Stenning) advocated this control. Really, however, matters of detail seemed scarcely worth consideration, when their very existence was at stake. They had all seen how Lord Derby, last Monday night, when beset on all sides, had asserted their cause; and he would now read them the remarks in Wednesday's *Times*. It was one of the most cruel and heartrending articles he had ever seen; and it was really a question with him, whether they should abandon the cultivation of the land, or endeavour to adopt any means for improving their position. Mr. Churcher did not like to be driven away, nor did he (Mr. Stenning); but it was most discouraging and disheartening to go on. So they were to believe that neither the price of corn nor anything else had any effect upon them; and it was clearly proved that this was a landlord's question only. Now, really, when they found they were not making £1 per cent., he thought it was far beyond a landlord's question—he thought it was a question for tenant-farmers. The tenant-farmer wished to act with unanimity with his landlord; for the one couldn't go without the other. If they took away all the capital of the tenant, they must do away with all valuations, as Mr. Richards recommended. Hitherto the farmer's credit had stood well, because he could not enter without a valuation; and that valuation being paid, had given him credit and stability, and consequently the means of raising money, if he was a little short, more easily than a man in trade could. He should be sorry to see men enter without a valuation; for it would cause competition for farms from men without capital. As it was, men entered farms without anything to fall back upon; and the complaint was, in trading circles, that men took too much land in proportion to their capital. That system would be increased, were valuations done away with. Mr. Churcher had said the £600 were required for every 100 acres of land. He alluded peculiarly to the four-course system land.

Mr. CHURCHER.—To arable land.

Mr. STENNING.—Where you are taking barley, clover, &c.? In high cultivation?

Mr. CHURCHER.—In good cultivation.

Mr. STENNING.—But taking a farm on the five-course system much less capital is required than on the four-course. It seemed to him a large amount in the present state of things. Mr. Churcher proposed that £300 should remain, the tenant paying an advanced rent. He thought there should be one uniform system.

Mr. CHURCHER merely meant that the valuation should be half and half.

Mr. STENNING thought that principle very good, for it relieved the tenant, and left the landlord perfectly secure. He agreed with Mr. Churcher that there should be a valuation, and a full valuation; but he did not agree with him as to the half-fallows and half-dressings. As to £30 per cent. abatement, was it possible, even with that reduction, we could maintain the best cultivation?

Mr. CHURCHER.—On the best lands we could.

Mr. STENNING.—I should question that very much myself.

Mr. CHURCHER.—I know land now where, if the tenant had an abatement of £20 per cent., he could keep on with it. With a reduction of £40 per cent. a man might hold on the worst; at least if it was not worth that, it was not worth anything.

Mr. STENNING.—I do not feel myself I could. Would £30 per cent. on the rent be a remuneration on a farm which now, confessedly, does not pay £1 per cent.?

Mr. CHURCHER.—But I look to better times; this has been the worst year, I hope, we shall have.

Mr. STENNING, on the contrary, thought the last year one of the most favourable which the farmer, under the present system, could expect. They had had more than an average crop at home, and they had a fearful failure—in fact a famine—on a great portion of the continent. He thought he understood from Mr. Churcher—for he (Mr. Stenning) made no secret of his own intentions to do so—that he (Mr. Churcher) was about to appeal to the income tax commissioners. He (Mr. Stenning) had hoped that he should have been in a posi-

tion to pay some income tax, but he found, on going through his accounts, that he was not in a position to show he had any profit—not one sixpence (loud cries of "Hear, hear").

A MEMBER: I should wonder if you were.

Mr. STENNING: As Mr. Churcher had said, they had been advised to try high farming; but how could they do this unless they were in a better position? As to the rents, the landlords might be anxious to keep good tenants, but they did not meet them in a way to keep them on their estates. It would be very much better for the landlords to come forward boldly and meet their tenants; for it must otherwise be useless to tell us how to cultivate the land, and to do justice to the landlord. Men said they were reluctant to farm as they were doing, but still they must look to their own interest, and not sacrifice everything they had got (applause).

Mr. WALKER: I want the half-dressings done away with; and as to shaws, I would have them grubbed up.

Mr. BROWN was satisfied that landlords were generally opposed to this system of half-fallows and half-dressings. If it continued, with the present system, how were they to get their sons into farms, with such heavy valuations?

Mr. RICHARDS said, they very seldom heard of tenant-farmers becoming bankrupts, but if so it was a question if the valuation would not go to the creditors generally and not to the landlord. The latter would have to come in as a common creditor with other parties. A Voice: And a good job, too (laughter). Mr. Richards did not think so: if a man lent money on mortgage at £4 or £5 per cent., he was entitled to be paid, because it was advanced for their benefit; but half the valuation would be merely personal security, and not such as many landlords would like to take. It would be better to reduce the amount of the valuation, so that there might be no question of credit between the landlord and the tenant but the rent.

Mr. JOHNSON could not agree with Mr. Churcher, because on his system one of the evils very much complained of—the excessive amount of Surrey valuations—would be increased, for he brought in several things having that tendency. As to Mr. Richards doing away with valuations, it would do away with all the security of the landlord, and the observations made as to tenants without capital entering on farms, had, he thought, a good deal of force. You had no hold at all on a man without capital. Half-dressings and half-fallows, and paying for leys, had, he thought, been very much done away with already. He might appeal to Mr. Richards if it was not so.

Mr. RICHARDS: I think it is.

Mr. STENNING: It is getting so more and more, from year to year.

Mr. JOHNSON thought that a step in the right direction; but there should be some valuation to pay. If a tenant had not capital to take a farm, he had better not take it.

Mr. RICHARDS: I did not mean to do away with valuations; it was only the half-dressings and half-fallows.

Mr. JOHNSON: Then, as to dressing in the land when the turnip crop had failed, it was still there, and to deprive the tenant of payment for it would not do at all. The best practical mode of letting a farm was by a very short agreement, not fettering the tenant hand and foot, but binding him not to exhaust the land by successive white crops, and if he sold roots, to bring in something in return. If a man farmed well, he would increase his produce, and have more straw and more manure; and that would in some measure compensate him, though not fully, for the greater exertions and improvements he had made. They couldn't define everything between a landlord and tenant, however they did it, and the fewer clauses they had the better, so as not to harass the tenant, and prevent his exertions. Mr. Churcher's clauses were rather complicated; they would leave room for doubt, and there might be some difficulty at the end of the term.

Mr CHURCHER then rose to close the discussion by his reply, no other member wishing to speak. He quite agreed with Mr. Richards, that, were no capital required, landlords would find double the tenants.

Mr. RICHARDS: Not with "no" capital, but not so much.

Mr. CHURCHER knew a farm by him taken by a man of no capital at a high rent; he farmed it very badly, and he had been obliged to leave. If, as he (Mr. Churcher) proposed, the landlord would let half the capital lie, that would meet Mr. Richards's argument. If a tenant took to 100 acres of good half-dressing, and only left 50, the landlord suffered a great loss. If he were not to be paid for the half-dressing, he would leave as little as he could; he would do nothing at all; and that would be a discouragement to that "good cultivation," which, by the terms of the question before them, they were bound to consider. He looked upon the valuers as respectable men; and he didn't look on farmers as all rogues—cheating everybody they could (laughter). If they were so, however, the sooner they were swept from the face of the earth the better. It was not unusual now to find 50 acres of good seeds, on a farm of 350 acres, ready for wheat; but if he was not to be paid for them he would not leave them, and that would be a discouragement to good farming. It was quite at a person's option to take a farm; and the landlord would find the man who took to the valuation a better tenant than one who did not. As to fallows, if a man had 40 acres of fallow, and he dunged it well, let it come a dry season and there might be no crop; but it had cost the outgoing tenant just the same to get a bad crop as a good one. It depended on the season and on Providence; and the tenant must take the chance of that, as he did of a good crop of straw and hay for the last year. If he took 10 acres of fallow, and left 20, was he not to be paid for it; and was there not value for the incoming tenant's money?

Mr. WALKER: They told me so (loud laughter).

Mr. CHURCHER: That was your fault, you saw the farm. Mr. Johnson had said that they should not be allowed to take two white crops in succession. He (Mr. Churcher) should not like to be tied to sow only one white crop, for he could very often sow an extra crop of oats after wheat, could fold it to advantage with his ewes and sheep, and make a good thing of it. He did not think the incoming tenant should have control over the fallows, so as to see that the ploughing was done at the proper times and seasons.

Mr. JOHNSON: There might be no work done in wet weather if that were so.

Mr. STENNING: I can only appeal to you whether you you would send out your own horses in wet weather?

Mr. CHURCHER didn't see much advantage could be taken in that way; perhaps there might be on wettish land. The valuers could always give more.

Mr. STENNING: I think they have just one system to go on: for so many ploughings it is the rule to allow so much.

Mr. RICHARDS agreed with Mr. Johnson that the agreement should be as short and simple as possible, but it should stipulate that the tenant should properly cultivate and sow so many acres of seeds and turnips, and then he would do it by his agreement whether he were going to leave or not. It would be his interest to have his seeds as good as possible.

Mr. CHURCHER: If he pays so much when he takes, and receives as much when he leaves, where's the difference?

Mr. WALKER had seen as good farming without half-dress-

ings as with, and as few bankrupts. If a man did his duty, he very seldom missed a crop. The question was, would having £2000 locked up in half-tillages make the tenant more respectable? It was just having so much more invested than the business really required.

Mr. JUGGINS was happy to be one of those farmers not paying for dressing and half-dressings—for fallows and half-fallows. He thought he was in a much better situation without them. It required less capital, and would decrease the "farms to let" in Surrey. Mr. Churcher wouldn't believe that there was any robbery under the present system, and Mr. Richards said it was too hard a term. But I (said Mr. Juggins) assert that it is quite mild enough. In my neighbourhood, a person who took a farm lately was complaining that he could not see the manure which the man said he had put on. "Get along with the ploughman," said a friend; "treat him with a pot of beer, and he'll tell you." The incoming tenant did so, and he saved by that pot of beer half the money he was charged: for when he went to his own appraiser, he found he knew nothing but what he might be told by the outgoing tenant. So he said to him, "I saw Tom go into the Plough, and in the course of conversation he told me there were only so many loads of dung on that field, and so many on this, for he was the man that drove it on." The appraiser told him to fetch Tom. Tom came in, and the appraiser said, "You drew the dung on such a field—how many loads did you take?" Tom told him instantly. "I know," said his master, "it was so many." The man said, "No," and his word was of course taken. Now, if that isn't a robbery, what is? and that is the reason many of you Surrey farmers are so tied up. I agree it is very proper you should pay for what you do see, and not for what you don't (loud cries of "Hear, hear"). In Hertfordshire there is no such thing. Men keep their own capital there, and find themselves much better off with it in their pocket than locked up in dressings and half-dressings (loud applause).

The CHAIRMAN felt Mr. Churcher was entitled to their thanks for having brought forward in the way he had, a subject which had led to so very interesting a discussion. The landlords were all but universally anxious to make such arrangements as would benefit their tenants. Their knowledge, however, was often imperfect, so that they were compelled to call in other parties to assist them. Hence some good might arise from the publicity given to this discussion, for nothing tested the value of a practice so thoroughly as submitting it to intelligent and practical men. He thought if the landlords read the report of their proceedings that night they would be much edified on the subject of the discussion. He very cordially moved a vote of thanks to Mr. Churcher for his able paper (loud applause).

Mr. STENNING: I have much pleasure in seconding it.

The motion was carried by acclamation, and the meeting separated.

—Sussex Express.

BURDENS ON LAND.

MEETING OF THE SPARKENHOE FARMERS' CLUB.

The quarterly meeting of this Society was held at the Dixie Arms Inn, Market Bosworth, on Wednesday, June 9th. The President (John Buckley, Esq.) occupied the chair. Owing to a heavy rain commencing early in the morning, and which continued nearly up to the hour of meeting, there was but a small attendance of members, but this was partly compensated for by the enrolment of the following additional subscribers, proposed by the Chairman:—William Brooks, Esq., Croft; and Messrs. R. Pratt, W. Gilbert, Pougher, Baker, J. Mayne, jun., W. T. Norman, and Cox. Proposed by Mr. Mayne—Messrs. R. Faux (Twycross), C. Lowe (Sheepy), S. Pilgrim (Burbage), J. Tavernor (Hartshill), James Hollier (Bosworth), J. Choyce (Twycross), Gardener (Twycross), Choyce (Upton Park), Wm. Bourne (Atherstone), Roadknight (Atherstone), Thorpe (Shenton), Joseph Lea (Shenton), Bacon (Ratcliffe), H. Sale (Atherstone), Wood (Ratcliffe), and Campion (Sharnford). Mr. Bucknill proposed Messrs. Messenger (Bosworth), T. Moxon (Bosworth), and J. Grundy (Bosworth). The candidates were duly seconded, and unanimously elected. Amongst those present we noticed, in addition to the Chairman, Messrs. G. Kilby, Harrison, Bucknill, Mayne, Whitby, Webster, Hubbard, Tavernor, Hollier, Timms, Lowe, and the Rev. — Jones.

The CHAIRMAN, in opening the business, regretted the small attendance, which no doubt was owing to the unfavourable state of the weather. He called on Mr. Kilby to read his paper "On those taxes, whether local or imperial, which press unfairly upon the occupiers of land, and what measures can be adopted to remove or mitigate such burdensome and unjust imposts."

Mr. KILBY, on rising, expressed the pleasure he felt in appearing before the members of the Sparkenhoe Club, and considered the subject set down for their discussion to be of paramount importance to the occupiers of land throughout the country. After a few preparatory remarks he proceeded to say—I am confident all of you will agree with me that there are taxes and rates which do press unfairly upon farmers, and which never were so severely felt as at this moment. When we were in a prosperous condition, and were remunerated for the application of our labour and capital in the cultivation of the soil, we complained not; but when we find, from causes which the ingenuity of man cannot control, we are placed in an opposite position, can it be wondered that we do complain? or can it be said that we have not cause to do so? By the policy which our rulers have thought proper to adopt, we find ourselves compelled to compete in the produce of the soil with all the world; and, for the most part, with nations which, compared with our own, are lightly taxed. I think, therefore, we are perfectly justified in calling upon our legislators to assist us in our difficulties, as an important class of the community, by reducing those national imposts which fall so heavily, and I may say exclusively, upon us. I will first speak of those public taxes which I consider to be unfairly levied upon the land; and

THE LAND TAX,

being the most ancient, will claim priority. This is a direct tax, which is levied exclusively upon the land, and is tantamount to a property tax, as far as it goes; and certainly while that tax exists it is an unfair impost, as it makes the land pay a double property tax. At any rate it is what Mr. Disraeli calls "a tax upon the raw material," and therefore, on the commercial principle that no raw material ought to be taxed, it should be remitted.

TENANT'S INCOME TAX.

As the land tax falls directly upon the owner, the next to which I will call your attention is one which falls exclusively upon the occupier—the tenant's income tax. I can safely appeal to this meeting, and ask whether the majority of tenant farmers have for the last three years been making any profit which ought to subject them to the arbitrary mode of having an income made for them by Act of Parliament? The matter was very different in time of war, when Mr. Pitt imposed the income tax. Farmers were then remunerated for their exertions, and made a profit on their holdings; but the case is now reversed; and it was a great oversight in the late Sir R. Peel when he followed the example of his predecessor, and estimated the income of the tenant at half the amount of his rent; and it was cruel that he should have allowed it to remain after he had repealed the corn duties. Since that time many a tenant has been made to pay for an income when he has suffered a positive loss; and upon a principle so outrageously unjust was the assessment made at the will and caprice of the tax surveyor that, in many instances, the tenant paid upon a greater rent than his landlord received, and in such cases he absolutely paid the landlord's as well as the tenant's tax upon the sum over the actual amount of rent. Suppose the original rent was £400, but, in consequence of the reduction in the price of produce, the landlord returned 10 per cent., which would be £40, the landlord paid property tax upon the sum he received—£360, but the tenant paid not only his own tax, but that of the landlord's also—upon the £40 returned. This was a state of things which none but farmers would tamely have submitted to.

THE HOP DUTY.

The next tax to which I shall call your attention is a heavy duty levied upon an article of limited production as regards the English farmer, but to those who fall under its operation is a burden of great magnitude, and in excessive tax upon the raw material. The article to which I allude is hops. There can be no doubt but the high duty paid upon hops has the tendency of diminishing their culture, and consequently withdrawing a large capital which, if they were free from duty, would be expended in employing labour upon the land, and has an injurious effect in those districts where hops are grown. From a Parliamentary return with which I have been favoured, I find that in 1837 the number of acres under this culture was 56,322, and in last year, 1851, it only amounted to 43,246, being a falling off of more than 25 per cent. in 15 years. The average duty per acre in 1850 was £9 17s., and the total amount of duty for 1851 was £236,623. This is certainly what Mr. Disraeli would pronounce an excessive tax upon the raw material. There is something very unfair in levying this duty at the same amount for all qualities, when some are worth from 25 to 30 per cent. more than others.

THE MALT TAX.

The next item of our fiscal imports is of considerable magnitude, and of great importance to the occupiers of land, and is one of imperial taxation which I honestly believe presses with singular severity upon agriculture. This is the malt-tax. Malt being an article which is manufactured from that grain which is only second in importance which the land of England produces, we might have supposed that it would have been touched with a light hand by the tax-gatherer, in order that its culture might be encouraged, rather than retarded by heavy imposts; but the contrary is the case. I shall not, gentlemen, trust to my own opinion and conviction as regards the heavy duty which that grain bears, a crop which such a large quantity of land in this kingdom is calculated to produce. But I shall quote to you the opinions of a high authority in order to prove that this tax is a burden which unfairly presses, both directly and indirectly, upon the occupiers of land. [Mr. K. then quoted from a speech delivered by Mr. Disraeli at Aylesbury, showing the injurious operation of the malt-tax on the land, and proceeded to say]—Here we have an exposition from high quarters as to the magnitude of the burden imposed upon one crop, which is only second to that of wheat, and cogent reasons are given for its repeal. I think this opinion, expressed by such a man, must give us every encouragement to exert ourselves, in order that we may get rid of this tax, which presses so unjustly upon the farmers of England. That 10 or 11 millions sterling should be raised from barley alone by taxation, must of necessity greatly lessen the demand, lower its value, and impede its culture. Down to the year 1829, there was a duty of 5s. per barrel on beer, and the consumption was 1 bushel 6 gallons per head; but this tax being repealed that year, an impetus was given at once to consumption—the average of 1831 was increased to 2 bushels 2¾ gallons, or about 30 per cent. In 1840, 5 per cent. was added to the duty, and the consumption fell to 1 bushel 7 gallons, at which it has, with little variation, remained ever since; but I find in 1850 the actual consumption was only 1 bushel 2 gallons and 1½ pints, taking the population at 20 millions. From these figures it is clear that the increased duty diminishes the consumption, and a less quantity of barley is required, and the price in consequence decreased. Cutting off this extra demand by an excess of taxation is highly injurious to the growers of barley, and tends to lower the price of the raw material; and if the tax was repealed, more land would be placed under barley culture, and by a greater demand would be increased. Supposing that as much malt per head was consumed, should the duty

be repealed, as was 100 years back, that is, 5 bushels per head, and that our population is now 20 millions, it would require 12½ millions of qrs. to meet the demand; but supposing we take it at 3 bushels per head, the consumption would be 7½ millions instead of 4¾. This, no doubt, would create a brisk and extensive demand for barley, and benefit the farmer to a considerable extent; as he might then, as he is recommended, turn his attention to growing that crop, instead of so much wheat. The opinions given before a committee of the House of Lords, by some eminent agriculturists, bear me out in this supposition. Mr. Baker, of Writtle, said—"If the duty were abolished, I think 50 per cent. more would be sold for malting purposes." Mr. Jonas says—"I consider that, generally speaking, the malt-tax discourages the growth of barley, and no doubt, if it was repealed, its growth would be greatly increased." Mr. Hudson, of Castleacre, says—"If the malt-duty was removed, the demand for barley would be considerably increased for all general purposes." And I think our friend Mr. Chamberlain has said, if malt paid no duty, he believed the average price of barley would be raised 10s. per quarter. These are the opinions of men who ought to have great weight in the controversy. I have hitherto only discussed this question as it affects the producer, but surely we have some right to complain of it as consumers, and more particularly in the way of feeding our stock on malt; and it is a great injustice done to farmers in not being allowed to malt their inferior barley as food for stock, and agriculture is injured thereby to a considerable extent. I may go further than this, and say, if this tax were repealed, a further advantage would be given to us. I think no one can deny but that the farmer is unfairly treated, and considerable injury is thereby done to the agriculture of this country. I do not mean to say, excepting in this instance, that the consumer's tax presses unfairly upon the occupiers of land, because every person pays the same proportion who uses articles manufactured from barley; but even this tax remitted would be some relief to the farmer as a consumer. Supposing he pays £5 per annum duty upon the malt he consumes for every hundred acres of land he occupies, this would be a saving of 1s. upon each acre. I think when the free-trade policy was adopted, we ought to have been relieved of this burden, or the principles of free-trade were not fairly carried out. When we were protected by import duties the case was very different; but now, when we have to meet the whole world in competition, it is cruel to fetter us with restrictions which paralyze our energies, and prevents us coping with the foreigner on fair and equal terms. I am constrained to make a few short quotations from statesmen on this point. Mr. Villiers, the great champion of corn-law repeal, says:—"Would the landed interest be willing, if the malt-tax were taken off, to release the country from the tax on corn; for of this he was sure, that all those who were now injured by the corn-laws would be ready, nay be anxious to get rid of it (the malt-tax). By according to those terms, the produce as we should malt barley of a coarser kind—that grown on strong soils, and give to our labourers more beer, and get the harvest in at a cheaper rate. Also, it would have the effect of inducing farmers to keep more servants in the house, and feed them on the produce of the farm, and thereby improve their social condition; for it must be admitted, that great evils ensue from young men neither boarding nor lodging in the house of their master—the beer-shop is too frequently their resort in the evening instead of the farmer's kitchen, and their being free from all restraint leads to vicious habits, which frequently ends in ruin. I cannot but say, that I think the greatest injustice is done the farmer on the first point—not being allowed to malt his inferior barley as food for stock. It does appear an intolerable hardship that the English farmer should be prohibited from using his produce by any mode of preparation which would improve its nutritious qualities, whereby his stock would be more quickly fattened; but this is not the worst of it. Since the importation of stock has been free of duty, he is obliged to compete with the foreigners in our home markets, who is under no such restrictions. He can malt his barley, feed his stock upon it, transport them to our shores, and undersell us, because he has no duty to pay upon his malt—in this matter I of the malt-tax would be lost to the revenue, no doubt. Four millions and a-half is a small sum indeed, compared with what might be raised through the medium of taxation, if the energy of the country were allowed its full and natural play." Here is an admission from an enemy, that the nation would only consider it an act of justice that we should be set free from this burden if the corn-laws were repealed. Mr. Cayley said—"If the malt-duty was repealed, we might fairly expect the consumption to be TREBLED." The Earl of Ripon said—"If the government did away with protection, there must be no exception; the farmer must be allowed to grow his own *tobacco, beet-root, sugar, and make his barley into malt free of duty.*" Sir James Graham said—"He was convinced that if they repealed the corn laws, the *malt tax* would not survive a *single year.*" Sir Robert Peel said—"As a farmer to the free-traders, let me grow my own tobacco; let me manufacture and consume my own *malt untaxed.* The articles that I wear at present are all taxed, from the sole of my shoe to the crown of my hat. If the article I raise and sell is to be exempt from protection, let the article I buy be exempt also." With these great authorities my own convictions perfectly coincide; and if ever we are to obtain justice, the time has nearly arrived when we should make an effort to do so; and, I firmly believe, if the appeal be made when the present ministry hold office, with the sanction of the country, they cannot resist granting it. In whatever way we view the question, one cannot fail to see that the malt-tax inflicts a grievous, impolitic, and unjustifiable injury on the farmer, and that sound policy and even-handed justice demand the "*total repeal of this obnoxious tax.*"

TRANSFER OF LAND.

I think this a subject which ought to engage the attention of the legislature; but as to the benefits which may accrue to the occupiers of land from any change in the law on this subject, I think they are rather remote.

LOCAL TAXATION.

The first question under this head is the money collected for the relief of the poor, and, when I consider its enormous amount, it certainly is worthy of the consideration of the occupiers of land, who are such large contributors towards this rate. I find in the last twenty-two years the largest sum was levied in 1832, amounting to £8,622,930, and in the last year the amount was £6,778,914, being a reduction of £1,844,016, so, at the first glance of these figures the farmer may imagine that he is actually benefited to that extent. I will take the equivalent of these sums in quarters of wheat, and then contrast the amount you have really paid in the produce of your

farms at those two periods. In 1832, the average price of a quarter of wheat was 63s. 4d., and to raise the sum paid in that year for the relief of the poor, it required 2,723,027 quarters: in the year 1851, the average price of wheat was 39s. 11d. per quarter, and to raise the amount paid to the poor, it required 3,396,533, being an addition of 673,506 quarters, or 20 per cent. more than to pay the lesser sum in 1851, than the larger you paid in 1832. I think this places the matter in a true light, and proves that the burden of the poor's rates upon the occupiers of land was last year actually more by 20 per cent. than it was 20 years back, when the sum collected was 22 per cent. higher, while all other classes are benefited to the full amount of the reduction, the occupiers of land are paying 20 per cent. more, taking the price of wheat as the standard of their ability. I must consider this as an effect produced by the repeal of the import duties upon foreign agricultural productions; and consequently, as relates to the maintenance of the poor, has thrown an unjust share of that burden upon farmers, which our rulers ought to endeavour to free us from. Mr. Kilby then gave a sketch of the early history and introduction of the Poor Law under the 43rd of Queen Elizabeth. Now this statute (43rd Elizabeth) defines the property which it renders liable to be rated to the poor, as "land, houses, coal mines, saleable underwood, and tythes,"—and, though the words of the statute are very loose and general, still it mentions personal property *locally visible*, and productive within the parish—so that, it is tolerably clear that all productive property, at that period, was intended to come within the scope of this Act. I think no one will dispute that this principle is a fair and just one, but from the change in property it does not strictly apply in the present day. Since the enactment of this law *other* property has accumulated in this nation which could not have been contemplated by the wisest legislators of that period. Why, who at that time could have imagined that there would have been created a new species of property, yielding an annual amount of profit of between 27 and 28 millions sterling?—or had it been in existence when this law was passed, would it have escaped being rated for the relief of the poor? I trow not—yet such is the income derived from our National debt of 800 millions!! which at this present moment pays nothing towards the relief of the poor. Why, when this law was passed, the whole public revenue of England only amounted to half a million, notwithstanding the magnificence and pomp of the Court of good Queen Bess—while at this time it exceeds 50 millions. This shows the altered state of our financial circumstances; and, certainly, with this great change, the charge towards the maintenance of the poor ought not to remain in the same state it was 300 years back; while it does so, the owners of that kind of property originally rated, suffer a great injustice. Mr. Kilby then read some extracts from Mr. Disraeli's speech, to show how unfairly the land was burdened with poor's rates, and proceeded.—Here we have the authority of that great statesman the present Chancellor of the Exchequer, for maintaining, that under the present mode of assessment, the land is paying 8 millions out of 13 collected, and that this is more than fairly falls to its share by 6 millions, or 10 per cent. upon the whole rental of the country. If we could get this 10 per cent. taken off our shoulders, which in justice we ought to have, it would be some relief, and though small, yet, as contained in one item, I would gladly receive it. The inequality of rating to the poor in different parishes is another great evil, inherent in the present system. One parish may pay 6d. in the pound, and the next as many shillings, and this has partly arisen from the selfishness of individuals, and has proved a source of oppression upon the poor. When a parish belongs entirely to one person, he may have used his influence in ejecting the poor man and his family, pulling down his cottage, and driving him into another parish where he could obtain a dwelling; and here settlements have been increased, and in the other diminished, when in fact, as much labour may be required in the one as in the other—this is a very common occurrence, and in my judgment is fraught with many evils. My humble opinion is, that all property ought to bear an equal share of this burden; for as all classes are benefitted by labour, so all ought to contribute according to their means, towards the support of the sick, destitute, infirm, and aged poor. I do not think it any fair, at least no tenable argument, that the fundholders should be exempt from this charge, because he employs no labour. What would the sum be worth inscribed in his name in the books at the bank of England if it were not for the industry and enterprise of those who create our national wealth, which finally yields the interest paid to the public creditor—then who can say that the labourer is not employed to his advantage? and ought he not to contribute towards the support of the poor man when he can no longer work for his bread? Mr. Kilby then discussed the question of a general system of rating holding to the opinion that all property ought to contribute to the relief of the poor, either by a county or national system. He read some extracts from the evidence of Mr. C. Lewis, who was in favour of a national tax. Upon this Mr. Disraeli observed —"Such are the opinions put forth, under the authority of the Government, by Mr. Cornewall Lewis, who has thus arrived, after full consideration, at the *truth* upon the subject—recognised not only in this house, but in the country generally." He further says—"Nothing but the difficulty of reaching any particular kind of property should establish an exemption from contributing to the poor-rate." I believe there is one and only one way in which they can be removed, and that is by adopting the principle of an Income-tax to raise an annual fund from which all relief to the poor should be paid. In a tax laid for this purpose I do not hold with exceptions; but every person above the condition of a common labourer should contribute towards it according to his means. I well know the great objection to a tax of this kind is its inquisitorial character; but we bear all this now it is imposed as an Imperial tax, and, I believe, the public generally would bear this anoyance more cheerfully if they knew it went for the relief of the poor, rather than into the national exchequer. Mr. Kilby then referred to a letter published in June, 1850, by Lord Malmesbury, on Parochial Assessments. As Lord Malmesbury is now a cabinet minister, he hoped the plan he suggested would be carried out. I am thus far strongly inclined to believe that such a poor-tax, or national rate if you please, would be of great benefit to the occupiers of land; and, in my opinion, would saddle no unjust share of the burden upon others; and by distributing it over all descriptions of property, would render it very light indeed.

LAW OF SETTLEMENT.

There is another question which is intimately connected with relieving the poor from a general fund—that is the law of settlement, and it appears that one is the natural consequence of the other; but Lord Malmesbury has hit upon a plan which does not render this absolutely necessary. For my part, I would rather see free scope given to a measure of this

kind, and that every Englishman, who should happen to be destitute, should be relieved wherever his residence might he within the kingdom. The present law of settlement entails a mass of evils upon the labourer, and prevents him from obtaining employment, which he might do, if he were free to take his labour where it was most required. I could wish to see him emancipated from all restrictions of this kind, for, if we are to have free trade for the employers, let us adopt the same principle for the employed. A national settlement would prevent that ill-feeling which prevails amongst different classes as regards parochial settlements. The inhabitants of large towns accuse the landowners of pulling down the cottages of the labouring mechanics, and driving them from their rural abodes into the towns. The landowner, on his part, retorts and says the manufacturer employs his workmen just as long as suits his convenience, and then turns them up for the land to maintain, which seems a great hardship, as the occupier of land has received no benefit from their labour. Both these complaints may be true to some extent, but the proposed change in the law would dispel all complaints of this kind. Though the money expended in litigation has much decreased since the passing of the New Poor Law, still it is now considerable, and a national settlement would prevent all expenses of this kind. I find in the years 1813, 1814, and 1815, no less a sum than £977,000 was spent in law alone to determine the settlement of paupers. From 1800 to 1834 the sum was from £280,000 to £300,000 annually, and in the year ending the 25th of March 1835, it was £202,527, and in 1836 it had decreased to £172,431—for England and Wales. For the county of Leicester the sum stood thus—in the year 1835, £3,808, and in 1836, £3,771; the whole expenditure for the relief of the poor being—in 1835, £83,986; in 1836, £70,077; and in the last year the amount is £65,201. I must conclude with the opinion that a system which would do away with these charges, and prevent such contests between different parishes, would be a great improvement upon the present law. Just let us hear the opinion of Mr. Disraeli on this subject:—"Let me remind the house that, while the owners and occupiers of land have been advised to employ more labour and more capital, their efforts are restricted by two codes of law, the very object of which is to restrict the application of labour and capital. Before you give them that advice, why do you *not deal with the Law of Settlement*? For five years we have been taunted with not employing more labour, when you have an ancient code in your Statute Book which prevents us, and forces us to employ the least efficient."

COUNTY RATE.

As regards this charge, I do not see any injustice in its being levied upon the land, excepting the defect in rating, which is applicable to the Poor's Rate, because it is paid out of that fund. The inhabitants of large towns have to provide their own police, to build and maintain their prisons, and pay for the prosecution of felons; therefore, it would not be fair to subject them to pay any share of the county rates, and it is only as to the irresponsible power which is vested in those who have the levying and expending of these rates to which I object. The system of committing the rating of the inhabitants of corporate towns to elected authorities has been legally established, and I must ever contend that the same principle should be conceded to counties. Why should we be denied having a voice in electing those who expend the money collected for us for county purposes, as we have in the choice of those who administer relief to the poor? It is no valid argument to say that this fund is watched with the most scrupulous regard to economy by the magistrates in this county; because, if it be so here, we know there are complaints and great dissatisfaction expressed in many others. But still, perhaps, I may be permitted to remark that, did the ratepayers possess that constitutional control over the authorities who levy and expend the county funds, and which I believe to be their due, the public debt of the county would not have been so large as it is at the present time.

WHAT MEASURES CAN BE ADOPTED FOR RELIEF.

By what means can we, the occupiers of land, get those measures adopted by which we hope to obtain some relief from this oppressive taxation? We all know that it can only be effected through parliament, and depends upon the will of our legislators, and it becomes us seriously to consider what influence we, *the only suffering class*, can use with our representatives in the House of Commons. I contend the different classes, and nearly every individual, which constitute the two houses of legislature in this kingdom, are at present materially benefited by the adoption of the free-trade policy, and "they know the reason why." Perhaps there are a few who may be rather large occupiers of land, and so far they will be sufferers, but they are only a small number, and in all probability, from possessing large estates, their loss by farming is of no consequence to them; therefore, there is no real inducement from self-interest for them, and less for others, to wish for any change. I am convinced if the owners of land were suffering to the same extent as the occupiers, we should soon get relief from some of these taxes which oppress us. But what, gentlemen, is the casual return of 10 per cent. upon the rental of a nobleman's or gentleman's large estate compared with the advantage he receives by the reduction of 30 per cent. upon all articles he consumes in his establishment? Now let us look at the position of those who are out of parliament, and form the electoral body; I am persuaded they also, at present, are benefited by free-trade, with the solitary exception of that large body who are occupiers of land. The farmers are the only class suffering from the abrogation of import duties upon foreign agricultural produce, and I fear, though in this unpleasant position, we have little sympathy from the public—by about one-half we are considered as ignorant, stupid beings, not possessing sufficient judgment or skill to manage our business as we ought, and by the other, hypocrites—I only wish I was an hypocrite in this respect. In this dilemma, gentlemen, we must fight our own battle, and the time is at hand which will give us an opportunity of exerting the influence we possess in returning men to parliament who will insist upon justice being done to the occupiers of land. We are on the eve of a general election, therefore it behoves us to use great caution and judgment in the exercise of that privilege which our constitution gives us, in electing those who are to represent us in the next parliament. Remember, the next parliament is that from which we hope to get some remission of that load of taxation, whether imperial or local, which we now unjustly bear, and if this opportunity is neglected, we need never expect to get any relief whatever. I well know candidates are very chary of giving their candid opinions upon particular measures, and much less willing to give distinct pledges. I think the time has arrived when the farmers of England should demand to know the sentiments of those who solicit their votes as to those burdens which now oppress

them, and it would be well that the following questions should be put, and distinctly answered by every candidate before a single vote is promised:—Will you support a measure which will exempt the tenant-farmer from payment of income-tax, if he proves that he does not gain a profit of £150 per annum by his farm, which were the terms of the original act? Will you vote for the repeal of the malt and hop duties? Will you give your support to a measure for lessening the expense in borrowing money upon, and the transferring by sale of land? Will you vote for charging all descriptions of property to the poor's-rate, and for a change in the law of settlement? Will you support and vote for a measure which shall give to the county rate-payers the privilege of electing a portion of that body which shall have the power of levying and expending such rates? If these questions are answered in the affirmative, well and good, but if in the negative, refuse your vote, for if you are afraid to act independently, you do not deserve to be relieved from those burdens of which you complain. The only way to be safe is to demand such pledges from candidates, and also a promise that, when in parliament, they will favour a revision of our whole financial system; and moreover, that they will insist upon economy and retrenchment in the public expenditure. If excuses are made that the public revenue cannot spare so large a sum as the repeal of the taxes I have named would abstract from it, read to them the words of the present Chancellor of the Exchequer, addressed to the South Buckingham Agricultural Society in October last:—"Well, then, I am asked what good is there in stirring in these questions? Are six millions of local taxes to be taken off land, even if it does unjustly contribute it? Is it possible that they can be taken off in the present state of the finances of the country? Is it possible you can do without the malt-tax and the land-tax, because they are opposed to the principles of financial justice and fiscal equity? My answer is—THERE IS A GREAT INTEREST SUFFERING, IN CONSEQUENCE OF YOUR LEGISLATION. It is necessary for me to discover what are some of the causes of its suffering; and I am not to teach you how you are to pay your bills—how you are to discharge your debts—but I am to show on the part of the agricultural interest, whom you acknowledge to be the only suffering interest, and who are suffering in consequence of undue taxation; and it is for *politicians*, and *statesmen*, and *persons who represent the community*, that are revelling, we are told, in every degree of prosperity—it is for them to devise how they can meet their engagements in the most easy and convenient manner for themselves" (cheers). These sentiments do credit to the present Chancellor of the Exchequer; the farmers of Bucks might well cheer him when he gave utterance to them; and I hope he will never forget them. [Mr. Kilby then read extracts from the address of Mr. Disraeli to his constituents.]

I have now, Sir, given this meeting of the Sparkenhoe Farmers' Club my sentiments at too great a length I am well aware (but when you set me the task to open the discussion on such important matters you set yourself the task to hear me) on those burdens which press unfairly upon the occupiers of land, and have pointed out, as clearly as I can, in what manner I conceive they may be mitigated. I know that great difference of opinion may exist even amongst us on these weighty subjects; and I can only say that I consented to lead this discussion in the hope that the greatest freedom would be taken with my remarks, in order that, if they be incorrect, or not founded upon reason and justice, they might be refuted; and I assure you, gentlemen, that I am not so bigotted to my own opinions but that I am open to conviction, and will gladly embrace any plans which may be better calculated to give us relief under our present difficulties. I have quoted largely from Mr. Disraeli, and I have done so that the sentiments he expressed, and the sympathy which he evinced for our unfortunate position, when he was in Opposition, should be impressed upon your minds; and I hope he will not act contrary to those opinions (which are in unison with my own on almost every wrong of which I have complained), now he holds the important office of Her Majesty's Chancellor of the Exchequer. Surely we have much to expect at his hands; and as the Prime Minister has plainly told us that he cannot restore Protection unless the country wills it at the next election, and he has also candidly admitted in his place in Parliament that his opinion was such a majority in favour of that measure would not be obtained to warrant the attempt. I only wish he may be mistaken; but, with such an avowed opinion before us, from what source are we to expect relief, except in the removal or mitigation of those taxes, whether local or imperial, which press unfairly upon us, the producers? who, I firmly maintain, thus far, is the only important class which suffers from the adoption of the free-trade policy. This, in my humble opinion, is the only chance left for us; and with the recorded opinions which I have quoted of the Chancellor of the Exchequer as to the wrongs we endure, can it be doubted that he will, by virtue of the office which he holds, in conjunction with his colleagues, devise some remedy to emancipate the occupiers and tillers of the soil of old England from their present state of suffering?

The CHAIRMAN, in proposing a vote of thanks to Mr. Kilby for his very elaborate paper, said the lecturer had observed that as they had set him the task of preparing a paper, they must also set themselves the task of listening to it; for his own part, instead of it being a task, it had been a great pleasure to him, and he had no doubt it had been the same to the company. (Hear, hear.) He should rejoice to see Mr. Kilby as one of their representatives, for he was sure he would make a good one; and if he would allow himself to be put in nomination at the ensuing election, there was little doubt but he would get in. They had been continually told the malt-tax could not be spared, but it was his opinion that if the government could not do without it, after having placed them in the position they had, they were not fit to remain at the head of affairs. They could lavish money on the Caffre and Burmese war, and because the days were not long enough, they must begin to fight on Easter Sunday. Some raised an objection to the repeal of the malt-tax because that numerous body—the excisemen and supervisors—would have to be pensioned off. They might readily get rid of them by paying their passage to the gold diggings. He should not attempt to follow Mr. Kilby in his arguments for the repeal of the malt-tax, but he must express his strong opinion against the injustice of paying a tax on their own produce. Little had been said about Protection, because it was said to be dead and buried; but if a farmer bought a Paris hat in France, or purchased his wife a silk dress, he had to pay a duty on it before he could get it home. Then why should not the farmer be protected in the same way, or suffer his raw material—the land—to be untaxed?

The Rev. —— JONES seconded the vote of thanks. Although not a farmer, he knew sufficient, from going amongst them, that they were burdened with more than they were able to bear.

Mr. Harrison had turned over the subject in his mind that morning, but not for the first time. There was a decided injustice done to the farmer on many points, and it was their duty to consider what means could be adopted to remove those grievances. In the first place it seemed to be necessary that the farmer should be properly rated on the value of his land, and nothing more. He considered there was a law on the statute book—the law of distraint—which more particularly affected the rating. A man who had capital, and was disposed to invest it in the farm he occupied, was prevented in some cases because a man who had no capital might go to the landlord and say, "I will give you so much for such a farm." The landlord might say to the tenant A, that B had been to him and offered him so much more, which must be the rent at which he should let the land. Was that fair to the individual who had capital to manage the land? The evil did not stop there, for the rates were regulated according to the rent, and the man who farmed his own land was saddled with additional and unfair rates. He was an advocate for all property to be equally rated. He knew of a tradesman who, whilst he was in business, hardly paid any rates; but directly he retired, he invested some money in land, and as soon as he became a lord of the soil, he found out he had heavy rates to pay. He concluded by moving the following resolution:—"That this meeting is of opinion that the taxation of this country bears unfairly upon the occupiers of land, and therefore a revision of our imperial and local taxation by Parliament is required, and that a more equal distribution of those burdens is necessary to relieve the occupiers of land from those which unfairly oppress them." Mr. H. agreed with Mr. Kilby as to the local management of county rates, and believed the farmer would be much benefitted by such an alteration. The fund-holder ought not to be exempt from contributing to the relief of the poor.

Mr. Bosworth believed that an example had been set by the "Bosworth Parliament," in agitating some of the questions under discussion. The questions to candidates hardly went far enough for him. In addition to getting rid of the obnoxious law of distraint, he should go one step further and ask for a tenant-right.

Mr. Mayne considered that when the legislature repealed the duty on corn, it was guilty of a great injustice to the farmer in not equalizing the burdens on land.

Mr. Bucknill expressed his thanks to Mr. Kilby for his very able paper.

Mr. Kilby acknowledged the vote of thanks, and a vote of thanks to the Chairman having been proposed by that gentleman and seconded by Mr. Webster, the meeting broke up.

The next meeting of the Society will be held on the 1st of September.

ON THE RELATIVE MERITS OF COPROLITES AND GUANO AGAINST FARMYARD MANURE.

The Yorkshire Agricultural Society has for several years past instituted a series of experiments for the working out of practical facts adapted to the soils and climate of that large county. Knowing the modifying effects of climate, soil, and peculiarity of situation, the council have year after year set about a studied and arranged set of trials, which tend to establish some one or other of the principles of agricultural truth. For this purpose, careful selections are made of practical and skilful farmers in various localities of the county, presenting variations of aspect, of climate, of altitude, and also of soil and geological formation; and to these is given respectively one and the same experiment, to try one manure on one crop; and all the results, brought to the test of the bushel and the scale, are registered and arranged for the information of the society's members.

But more: we all know one year's trials, even in different circumstances, is not sufficient to stamp a fact with undoubted accuracy. Hence, in some cases, two and even three years are required. Light sometimes breaks in in the first year, which a second either darkens or improves. The experiments of 1850 were on the relative merits of coprolites and guano against farmyard manure; the experiment committee arrived at the conclusion that, "in certain cases, turnips may be grown more cheaply with properly selected hand tillage than by heavy dressings of farmyard manure." To confirm, or to modify that opinion, the council sent out a set of manures, dissolved coprolites and Peruvian guano, supplied by Mr. T. Pearson, of Leeds, and the experiments were arranged under the following heads:—

1. To show the natural produce of the land, one part was to have no manure whatever.

2. Was to have twelve tons per acre of farmyard dung.

3. Was to have six tons of dung, and one cwt. each of guano and dissolved coprolites; and

4. Was to have 2 cwts. of guano and 2 cwts. of the coprolites.

Other substances might be tried as additions, but these were to be the standard experiments. The names of the parties who tried them were a guarantee for their accuracy and trustworthiness. They were Mr. Charnock, of Holmfield; Mr. H. Cholmeley, of Brandsley; Mr. T. C. Johnson, of Chenel; Mr. W. Mauleverer, of Aincliffe; Mr. Newham, of Edlington; Mr. Outhwaite, of Bainesse; Mr. Scott, of Broom Close; and Mr. Wailes, of Husthwaite.

We shall not repeat the valuable tabular results given—the foundation of a vast mass of agricultural information—but simply go through the gross results of the application, as regards weight of crop, with these *four* experiments.

Mr. Cholmeley's turnips, grown on a loamy clay, had the heaviest crop on No. 3, the dung coprolite and guano beating the farmyard manure by some 5¾ tons per acre.

Mr. Johnson's experiments were tried with various manures, singly; and his Peruvian guano gave the greatest weight of the class of substances tried, but 10 cubic yards of farmyard manure had previously been applied to the whole land.

Mr. Mauleverer's heaviest weight, when the manures were also applied singly, was with the 12 tons of dung, but only 14 cwts. more than the dressing with 2 cwts. of coprolites. This soil was a light clay.

Mr. Newham's, on a limestone soil, were the heaviest with No. 3—the same as Mr. Cholmeley's—and were 16 cwt. heavier than an application of dung alone.

Mr. Outhwaite's, on a hungry gravel, were the heaviest, with 9¾ tons of dung and 2 cwt. of guano, for all the land had been dunged at this rate, and exceeded 14½ tons of dung by 2 tons 9 cwt. per acre.

Mr. Scott's were the heaviest on No. 4—the guano and coprolites, and 1 ton 7 cwt. more than 20 tons of dung—his soil was a strong loam.

Mr. Wailes's were the heaviest, with 4 cwts. of guano and 4 cwts. of coprolites, showing an increase over 20 tons of dung of 2 tons 9 cwts. per acre; the soil a useful loam.

The first fact which strikes the observer is that, as a general rule, there is not only an addition to the crop by the addition of these artificial manures, but there is, in some cases, more absolute crop produced by them than by farmyard manure alone.

Now, to bring this to the test of figures, the coprolites at £5 per ton, and the guano at £10 per ton, will be at the rate of 2 cwts. of each—£1 10s. per acre. Now, assuming this to be equal to 20 tons of dung per acre, we should require to be able to produce the dung at 1s. 6d. per ton, to cost us the same money. But it can be neither produced nor purchased at any such money. In the whole of the cases referred to the manure would be most valuable, and yet we find that hardly in any case is there not an addition to the crop, of say two to three tons of turnips per acre, by such increase of manure. Now, if a ton of turnips be worth 10s., or even 8s., there is at once an element of repayment; for, if a soil is in a condition to give a large crop of turnips, it is almost certain to be capable of giving a large crop of any other plant to succeed.

Mr. Charnock—whose turnips, however, in the severe insect season of 1851, suffered from the fly, so as to render the trial unfit for a test—gives it as the result of his practical experience, that 4 cwts. of Peruvian guano, without manure, is the cheapest and best mode of growing turnips; but the general testimony seems to be decidedly in favour of what all farmers find it the best and easiest to do, viz., to add a *small quantity of artificial manure* to the manure which the farm will supply, and so to spread the whole manure over the land, rather than put all the dung in one place, and the rest to be manured with artificials alone.

Continuing our observations on the valuable experiments of the Yorkshire Agricultural Society on the substitution of Peruvian guano and dissolved coprolites in whole or in part for farmyard manure in the growth of turnips, which subject is by no means exhausted; we see the experiments bring to light a great variety of facts.

We see, for instance, in Mauleverer's experiment that 2 cwt. of coprolites alone produced within 14 cwt. of turnips as many as 12 tons of dung per acre. This is, we believe, however, on a newly-improved farm, where the phosphates might be expected to be somewhat deficient: 2 cwt. of guano produced little more than one-third of the weight on the same land.

Another strong fact, on the well-managed farm of Mr. T. C. Johnson, is, that the very best turnips he grew on his experimental strip were manured with the nitro-phosphate of Messrs. Hodgson and Simpson, of Walton, near Wakefield. While a specimen of stuff called guano produced only 9 tons 3 cwt. and 6 st. of turnips; and a pure specimen of Peruvian guano supplied by Pearson, of Leeds (whose chemical knowledge enabled him to supply a faithfully-analyzed sample), only 14 tons 6 cwt. and 6 st.; the nitro-phosphate produced 15 tons 9 cwt. and 7 st.—15½ tons nearly per acre!

We have heard of other equally striking circumstances of this combination of phosphoric acid and nitrogen, in the shape of substances probably designated ammonio-phosphate and nitro-phosphate. A name written on a wheat field on the chalk in the neighbourhood of Driffield, in Yorkshire, might be read a mile off; and on these chalks—so liable to have the phosphates washed out and the ammonia dissipated—an addition like this would be not unlikely to produce such an effect.

The experience of Mr. Charnock, of Holmfield, goes further; and he states as a fact that the dissolved bones are, for manurial purposes, far preferable to dissolved coprolites. But Mr. Charnock is a scientific man, and probably prepares his bones in a scientific manner; whereas too many farmers ruin them by ill-advised and unskilful mixtures or modes of solution. With them the coprolites or mineral phosphates afford a far better form of soluble bi-phosphate, when treated with acid by a skilful manufacturer, than the odd and heterogeneous

mixtures too often used by farmers ill-instructed in chemistry.

We hardly dare venture to name a few of the mistakes they commit. Some add ashes to the bones as soon as dissolved, or rather treated with the acid to neutralise its effects, or at any rate reduce them to a mere disintegration of the bone. Others, wishing to see heat and bubbling, add too much water to the acid, already of a low specific gravity, and so impair its action on the bones, and lessen the rapidity of that action, if not the very energy it ought to exercise. But all sorts of mixtures are added to the bone, salt—which will rather increase their solubility—*if* an additional quantity of acid be used; and, even ashes are used in some cases, and the confusion and bubbling of the gases escaping during the union of the sulphuric acid and alkalies of the ashes are mistaken for a great impression being produced on the bones.

The best mode, doubtless, is to drill them in the liquid form; if not, earth or sawdust, or stick-heap bottoms, are the best substances to mix. But, to those who have the means by a Chandler's or some such efficient drill, the liquid is the best of all forms of application. Mr. Cholmely dissolves the bones in a tub, and uses 15 lbs. of acid and 7½ lbs. of water—the acid being, of course, the commercial acid for farmers, and not that of the shops—to 1 bushel of bones. The bones are first saturated with water, and then the acid added: this remains two days. This is carried to the field, and then reduced with tank liquor in given proportions. The liquid being under 1,000 gallons per acre and the bones 4½ bushels. He finds, what is perhaps the best possible evidence of the value of the solution, that turnips drilled with the liquid manure drill are ready for hoeing at least a week earlier than by any other method. In a dry time, moreover, beyond the mere advantage of drought being overcome, the liquid is the very best form in which to apply any manure, *if* the water does not bear too great a proportion to the manurial matter.

Incidentally, an experiment is mentioned of a mixture of clay and manure. Mr. Scott took out 300 loads of farm-yard manure, and covered it with soil; and the same quantity, and mixed it with clay previously comminuted by mixing with ashes. The latter, however, would probably just do as much with their alkalies to dissipate the ammonia as the clay did to detain it. The result, therefore, was the first lot had 15 and the latter 14 tons per acre. On the whole, the committee say, "They have stated, on the authority of numerous experiments (tried now for three successive seasons), that turnips can be grown more cheaply by hand tillages than by manure. This, of course, only applies to those cases where both have to be bought; and, since all farmers must keep more or less stock, and convert their straw into manure of some sort, good farmers will do their best to make good manure, and so far as the average quantity of home-made farming and manure is concerned, the alternative of hand tillages does not apply. But over and above that amount of manure which is produced by ordinary good management, much expense is frequently incurred in fattening cattle on corn, oil-cake, &c., without any prospect of profit, but solely for the sake of adding to the value of the manure heap, and thus increasing the acreage and the yield of future root crops. In such cases, the perusal of the experiments detailed in this and the last No. of the Transactions, is calculated to afford valuable information, and to lead all who fatten cattle to consider whether, at the present price of beef, it would not be wise to retrench large sums now laid out in feeding stuffs, and whether every £100 so economized might not be adequately made up to the manure heap by the outlay of £50 in guano and coprolites."—Gardeners' and Farmers' Journal.

THE TRANSMISSION OF FOREIGN SEEDS IN SOIL.—At a recent meeting of the Edinburgh Botanic Society, Mr. M'Nab read a paper in which he stated that he had been long in the belief that the transmission of fruits and seeds in a fit state for germination would be better accomplished by being packed in soil than by any other known method. This experiment was fully tested by himself during 1834, when he brought over the seeds of many of the rarer American Oaks and other tress in boxes filled with soil, while portions of the same kinds of seeds packed, both in brown paper and cloth bags, were, in many instances, totally useless. The method he adopted for the American tree seeds, was as follows:—He purchased several strong deal boxes about 14 inches in diameter, and made of ¾ inch wood. He afterwards procured a quantity of soil taken from a depth of eight or ten inches under the surface so as to possess only a natural dampness. A layer of the soil two inches deep was placed on the bottom of the boxes, above which a layer of seeds was distributed; another layer of soil and then seed, and so on till the boxes were full; the whole was pressed very firmly down, when the lids were nailed on, allowing no possible room to shake about. When they reached Edinburgh, December, 1834, the seeds and soil were sown over the surface of shallow pans and boxes. During the following spring they grew freely; while of those brought home in the paper and cloth bags, comparatively few of the varieties grew, the acorns being without an exception perforated with insects. The kinds which grew were from four to five weeks later of vegetating than those brought home in soil. Acorns brought home in a box of sphagnum moss, after the superfluous moisture had been wrung from it, were equally successful with those in soil.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

THE LEWES SHOW.

Hitherto the Country Meeting of the Royal Agricultural Society has engrossed the attention of the leading agriculturists of the kingdom during the week in which it is held, but the elections for counties, which as observed by Lord Palmerston at the Pavilion Dinner, "naturally excite a peculiar interest amongst those who have turned their attention to agricultural pursuits," taking place at the same time, could not fail to operate prejudicially upon the number of visitors. Regarding the Windsor Meeting as an exception, it will be found that the numbers who visited the show-yard are below the average of several previous years. We are not aware to what extent returning officers have a discretion in fixing the day of election in counties, but we have heard it asserted that the election for East Sussex might have been held this week had those who have the power of appointing the time been so disposed. If such be the case, we think the adoption of that course would have evinced a sounder discretion, so far as regards the promotion of the objects of the society. There may perhaps have been other interests to serve, which were regarded as paramount to the interests of the society. Some persons appear inclined to infer that the falling off on this occasion of the number of visitors is indicative of a waning interest in the objects of the society; we have no hesitation in expressing our conviction that such a conclusion is erroneous. No circumstance has occurred, no reason exists, to cause such a revulsion of feeling. Day by day the desirability, nay the necessity, of adopting every economical improvement in farm management becomes more apparent; and if we look to the means whereby the Royal Agricultural Society seeks to promote agricultural improvement, we shall find that they have been more efficient than at any period since its establishment. The necessity of "adopting every economical improvement in farm management," so as to raise agricultural produce at the smallest possible cost, has long been inculcated upon general principles, not only by persons independent of political parties, but by the free-traders and those who advocated cheapness, as essential to our national prosperity. Within the last few days, an honourable gentleman, a great political light, a high authority with a large portion of the agricultural class, has given the same, hitherto not altogether palatable, advice. He observes—"I say, in accordance with the spirit of the age and the temper of the country, *let your produce now be raised upon the cheapest possible principle.*" If then "we look to the means whereby the Royal Agricultural Society seeks to promote agricultural improvement" we shall find that neither in the varied and sound practical information contained in the pages of the *Journal*, in the value of the lectures delivered by its professors, in the character of the objects for which prizes are offered, or in the growing excellence of its shows of cattle and implements, more especially the latter, are there any symptoms of deterioration. Valuable as those which preceded it have been, we believe the last number of the Society's *Journal* to afford more available practical information to the farmer than will be found in any previous number. Excellent as have been the lectures previously delivered at the Society's rooms, we hold that none have equalled those delivered by Professor Way during the year, in describing the connection subsisting between the science and practice of agriculture. Generally useful as have been the objects for which prizes have been offered from time to time, we are persuaded that none afford promise of such important results as the prize of one thousand pounds and the gold medal, offered at the instance of Mr. Fisher Hobbs, for the discovery of a manure equal in fertilizing properties to the Peruvian Guano, and of which an unlimited supply can be furnished to the English farmer at a rate not exceeding £5 per ton. And rapid as has been the progress of improvement in agricultural implements and machinery, never has it advanced in the beneficial direction of simplicity and cheapness with such speed as since the last exhibition at Exeter. As regards the arrangements at Lewes, it is not too much to assert that more general satisfaction was expressed by those who are placed in a situation to be most affected by their efficiency or inefficiency than upon any former occasion. We allude more particularly to that difficult but most important branch of the proceedings, the trial of implements, the result of which was satisfactory to all parties. In respect to the pro-

ceedings at the great dinner, ably and efficiently presided over by Earl Ducie, the President of the Society, it will be seen, by a perusal of the speeches, that in point of intellectuality they will not lose by a comparison with those delivered upon any former occasion. The stewards and judges of the Show went through their laborious duties with an energy and determination which must command success. The honorary director of the Show, Mr. Brandreth Gibbs, was, as usual, indefatigable in the performance of the arduous task which upon these occasions devolves upon him; and the secretary, Mr. Hudson, maintained the reputation which he has so long enjoyed, of being, as expressed by the noble president, "the right arm" of the Society. We trust we have said enough to show that not only is the Society not declining in the successful prosecution of the great objects for which it was established, or in the estimation of those who will most profit by its success—the people of these realms, of every class and denomination. — Mark Lane Express.

(FROM A CORRESPONDENT.)

The annual show of the Royal Agricultural Society enjoyed last year peculiar advantages; sufficient, in fact, to insure a bumper meeting, almost altogether independent of the Exhibition's real merits or attractions. People were already drawn into a focus, as it might be, on the spot; and, with this declared business of sight-seeing in full vogue, it would have been strange indeed had the receipts not been heavy. Though not perhaps in a proportionate degree, the Society suffers this year from concomitant causes, as it profited by them on the occasion of its last anniversary. A general "county" election week was about the very worst opposition a national agricultural association could have had to encounter, and the party colours flying in Lewes town itself spoke plainly enough as to the reason for any falling-off in the attendance at the show-yard.

In some respects, as will be seen on reference to the notice of the Implement Department, this Show was indisputably above the average; while in others it can be scarcely said to reach the strength of former years. In two or three classes the animals entered would fairly bear comparison with any preceding catalogue. Take the stock generally, however, and the report can hardly be so clearly in its favour. At a meeting held in the heart of the Sussex Downs, it would be only natural to expect to find the Southdown amongst the most prominent and best features of this department. And here the visitor, either neighbour or stranger, could not well be disappointed. He must have been hard to please if he was. The show of this now most fashionable of our breeds of sheep quite equalled last year's at Windsor, though the great credit of it is not due to the Sussex men themselves. Again, we had Mr. Jonas Webb first, and first in indisputable advance of his fellows; one of the most formidable of his competitors, Mr. Rigden, of Hove, being quite out of luck; and the strength of the home-party centred this season in Lord Chichester's flock, who must have every reason to be satisfied with the places he obtained in so good an entry.

After the sheep, Sussex would seem chiefly to pride itself on a breed of cattle almost peculiar to the county, and but lately admitted to a class in the prize list of the society. The poor show of these animals last season appeared hardly to warrant such a grant; neither did they command much general admiration on this occasion. Of course they abounded in the yard, and local judges went from Catt's to Denman's or Smith's, with evident appreciation of the animal. The more common public, on the other hand, have yet to learn their value, resting as it does perhaps more on their utility for the yoke than their appearance in the stall. They were "coarse, rough looking beasts," and wanted the round, neat, thorough-bred look of their more distinguished relative, the Devon. The show of the latter was not so "even" as it previously has been: this was especially observable in the prize beasts, where the purity of Messrs. Quartley, George Turner, and others, had to succumb to the substance of Mr. Farthing's variety of the breed. This gentleman, a Somersetshire man, contrives like the Sussex to make *more* of the animal, and the judges on this occasion went entirely with him. It is still a question, however, whether in the course of future proceedings this judgment may not be reversed. With so eminent a breeder as Lord Ducie for President, the short-horns lost none of their customary popularity; the contest, however, was all, this time, with our friends farther north; ending indeed in a very close race for the first prize. With many good—though not official—judges Mr. Fawkes' white bull was the favourite; they are both, though, magnificent specimens of the sort, and are well supported by Mr. Towneley's prize cows, about whose superiority there could be no mistake. The same gentleman's prize heifers, again, were as justly admired; in fact, such signal success from one herd has been but rarely attained; Mr. Towneley taking four prizes with only five animals exhibited. With the exception of the Southdown sheep, which above all others should have *here* been no exception, it is remarkable to observe how generally the prizes go to those districts in which the different varieties were first established. The shorthorns or improved Durham all yet come best from the north; the Devon premiums go to Devon and Bridgewater; and Mr. Price, a name long associated with the excellence of this stock, still asserts the supremacy of Hereford for Herefords. The Hereford bull, however, was not this year "the lion" of the yard: in fact, the class generally were somewhat neglected—more certainly from the heat of the weather and its effects on beasts so highly "made up" than from any deterioration in the quality of the animal. Who, as the noble president urged, may be the first "to immolate himself upon the altar" and show store stock as store stock, is a question more or less answered already. It is very evident there are many large breeders anxious to

do so; but at present they know it must be *at a sacrifice*. A striking instance of this disposition was seen in some of the Romney Marsh sheep-pens, Sir Edward Dering's, the winners, as generally as Mr. Sanday's were in the Leicesters, being certainly beautifully got up for the Show. There is no doubt either as to their being the best of the class; but the contrast between them and Mr. Jeremiah Smith's, which were penned close by, was very remarkable. Mr. Walter Dawes, who took a prize for his ewes, also exhibited more on the strength of his breed than his feed; but we fear these gentlemen will not make many converts. The tendency to brush up a little on the occasion of any display is but human nature after all. Mr. Sanday's place on the list speaks for itself; but it certainly is remarkable to observe how ably he sustains the character of the Holme-Pierpoint "Leicester." That Mr. Burgess so auspiciously commenced, Mr. Sanday would promise as becomingly to carry out.

So far the introduction of the poultry premiums into the list promises but little success: like the pigs, they remind one more of the winter or Christmas shows, and where they will always be seen to most advantage. It is a question, too, whether Birmingham has not a lead here that it might be as well to leave where it is. Of the pigs sent—and the exhibition in this respect was not a remarkable one—the improved Essex or Fisher Hobbs' sort had quite the call; although it will be seen the prizes taken by them now travel to all parts of the country—a tolerably sure sign of their general efficacy. In concluding this part of our notice, we must not omit to mention the very capital entry of horses—of the Suffolks more particularly. They were almost all, without exception, good, and some really wonderful for the judgment displayed in breeding them. In no department have the exhibitions of the Royal Agricultural Society improved more of late years than with this kind of horse. Of the Norfolks there were comparatively but few, though amongst these three or four very clever animals.

This Meeting has been one at which a great advance has been exhibited in several of the important machines used in the cultivation of the soil, in the preparation of produce for market, and in the manufacture of the green and root-crops into meat, thereby providing manure for the farm.

I purpose looking at the progress of the past year in a somewhat systematic way, and as the plough stands first, we will deal with it first.

It is true that the plough of this year is not much better than that of last year; but, by going to the cheapest market, as good a plough can be obtained at 25 per cent. less money—and that, in these times, is cheering, as it affords strong hopes of matters adjusting themselves to circumstances.

In common harrows there have been no improvements of great importance; but they have been made more perfect in the details of the improvements of last year. There was an excellent light harrow for covering-in clover and grass-seeds among grain crops after being hoed. It is constructed on the principle of the horse-rake, with two rows of teeth working independently of each other. But this implement is superseded by the advanced improvements made in Mr. Garrett's horse-hoe, which render it all that can well be desired by the farmer. He has attached a sowing apparatus to the front of the horse-hoe, with pipes to conduct the seed down, and spreading it broadcast between the drills of grain, so that none of it is deposited in the rows of the growing crop, where there would be no chance of its growing; the hoes following, cut up and loosen the soil to a very shallow depth; and two light teeth, working vertically, and independently of each other, follow in each row, teazing and amalgamating the soil cut up by the hoes—thus ensuring the destruction of the weeds and the covering of the seeds.

In the clod-roller there have been some well-designed attempts to beat Crosskill; but he has still maintained his place as the captain of them all.

In the Norwegian harrow there has been no progress made; in fact, it has been rather damaged by the machinery that has been applied to raise it from the ground when turning, which appendage has more than doubled the cost.

In scarifiers there have been considerable improvements made in simplifying them, and also a very great reduction in the cost of many of them.

Mr. Crosskill has introduced a new smooth roller of first-rate construction: it has a number of wheels eight inches wide, strung upon an axle, with holes two or three inches more in diameter than the axle; so that each wheel can drop into hollows or pass over heights, and all parts are equally pressed, thus filling up the place that has long been most inefficiently occupied by all sorts of imperfect rollers.

In harvesting machines and implements there has been an extraordinary advance, inasmuch as the reaping machine, which has been so long used in Britain, has been brought before this Society as the invention of Brother Jonathan, after having the model sent over to him, which we must give him credit for calling our attention to, and exciting the present generation to study the improvement of that which their forefathers have spent so much time in endeavouring to effect. Mr. Howard was, I believe, the only one that made the attempt to deliver the cut crop in quantities large enough for a sheaf. He has not yet succeeded, still the attempt has many feasible features in it.

The trial of these important machines took place on Tuesday morning, on a piece of rye, which was (through the able management of W. F. Hobbs, Esq., the steward) divided into long pieces of about half an acre each, by mowing a swarth out betwixt the pieces. Each reaping machine was started on its own piece, for which they had drawn lots, which, so far as the crop or ground was to be considered, was unnecessary, as one lot was as like another as it was possible for them to be; but owing to the dew being heavy, those machines that started first had not so easy work in cutting, as the wet and the green state of the crop combined caused the straw to clog the knives; but afterwards Mr. Ransome's machine began,

which worked well so far as the cutting went, though the men being novices at the work, and the horses being driven at an American pace, the delivery of the straw was badly done. M'Cormick's reaper was then tried, and worked well, but cut much higher than the others: it was managed by an American, who perfectly knew how to use it, and the work was satisfactory as far as the delivery was concerned; but the grass (growing on the side of a footpath, which had to be crossed by them all) seemed to clog the knives for an instant, so that a little of the rye was not cut just after crossing the path. The power required to draw this machine was much greater than Hussey's; the stubble left was too high for low cutting, and too low to admit of mowing it. After this M'Cormick's was the favourite until Mr. Crosskill's, which was set too low, and got some flints amongst the knives, which put a stop to it for a few minutes, in order to sharpen the knives injured, when it went off in good style, with the horses at a more moderate pace, but still far too fast. Mr. Garrett then came into the field with his man, who managed everything in such style, that he astonished everybody; at first he was not able to keep time with the horses, which were going at a trot; but after being reduced to a walk, things went on more satisfactorily, and the man was able to lay the stuff off in a very fair state, the horses were not driven anything like so hard as with M'Cormick's machine, another of which was tried with a man not much used to it, and it was evident that he was as little at home at the work as any of the others were with Hussey's, and did not lay the stuff off in any better style, if so well.

After a second trial of Mr. Crosskill's, Mr. Garrett's, and Mr. McCormick's (Mr. Ransome withdrew in favour of Mr. Garrett), the horses were kept at a pace of about three to four miles per hour, and then the men were able to lay the stuff off in a good form, and the cutting of both of Hussey's was excellent, that of McCormick's was too high; but from what was to be seen by this trial there must be something done to obviate the necessity of the horses travelling so fast: two to two-and-a-half miles per hour is quite fast enough for farm horses to walk, and the man would be able to deliver the cut crop in pieces large enough for making a sheaf each. Those parties who have reaping machines must not give up faint-heartedly, but persevere, and there is but little doubt that the work will be satisfactory, after the horses know what they are about, and the men get into the proper method of managing the machine. On examining the machines it was found that several important improvements had been made by Mr. Garrett in the manner of raising and lowering the machine to make it cut high or low as required; and his machine was finished off in the most superior way, every part of the iron work exposed to friction being polished, which gives it a great advantage. Mr. Crosskill has increased the speed of his knife, so that it cuts one-fourth oftener than the one introduced from America, which will allow of the horses travelling at a more moderate pace; but his machine was not got up in the superior way in which Mr. Garrett came out with his.

In the harvesting carts there has been very little advance made since the Norwich show, but the price of iron stack stands has fallen above 20 per cent., and a new material has also been introduced without being sufficiently noticed, namely, glazed earthenware pillars, with any rough timber that is come-at-able, and as hedgerow timber is of but little value it might be cut down and used for this purpose.

In the thrashing machines there have been great improvements made by combining the operations of thrashing, shaking of the straw, riddling out the short straw, and blowing out the chaff, all at once, by the power of that great agent, steam; thus making a great saving in the expense of thrashing.

The Royal Agricultural Society of England has much to be proud of, in so stimulating our agricultural engine makers. The talent of Mr. Hornsby has brought before the public an engine that can work up to its full power with 4¾lbs. of coal per horse power, without using an expansion valve; thus eclipsing the great commercial and manufacturing engine makers—and proving to the world that this Society has done more than the combined societies of the manufacturing interest.

In the chaff-cutting engines, Richmond and Chandler have given a complete go-by to everything that has been produced before, inasmuch as his new machine does the same amount of work with forty-five per cent. less power in the same time; thereby reducing the expense of this important work. This machine also has an important appendage for sharpening it by merely turning two screws, and giving the machine a few turns backwards.

In the turnip-cutters, Messrs. Ransome and Sims have attached a crushing apparatus to Gardner's machine for preparing the roots for mixing with chaff.

Messrs. Burgess and Key have brought out a root cutter on an excellent principle; but it requires some slight alteration in its details, which the able engineer of the society kindly showed them how to effect.

In the drills some important simplifying alterations have taken place, and it was gratifying to find that our two champions, Hornsby and Garrett, keep running each other so close with their drills and thrashing machines, but they have got other formidable opponents in Messrs. Clayton and Shuttleworth and Messrs. Ransome and Sims.

It is believed that the long desired mill to cut or grind all sorts of grain and pulse into fine meal is now realized, in the patent metal mill invented by Mr. Hurwood, and made by Ransome and Sims. It grinds with fifty per cent. less power than stones.

An important appendage might be made by putting one of Kase's force-pumps over one of Crosskill's liquid manure carts to be used in spreading the manure; and, if always kept full of water, would serve the purpose of a fire-engine. It throws forty gallons per minute to the distance of forty feet.

From the above remarks, it will be seen that the implements and machinery exhibited this year were of a more practical nature, and gave the judges, in many cases, greater difficulty to decide which was the best.

But, in the trial-yard, Mr. Amos with his testing dynamometers settles the matter of the power required to do the work, and to this are we indebted for the rapid stride that has been made in our machinery. Since he has become the Society's engineer it is to be hoped that he will turn his almost inexhaustible talents to bringing out a more accurate dynamometer, so that the field implements might be tested as to their draft, as it appears that those ploughs that have the longest turn-furrow have the heaviest draft, and as the fashion runs in the direction of increasing the length of the turn-furrow or mould-board. L.

THE ROYAL AGRICULTURAL SOCIETY.

THE LEWES SHOW.

(ABRIDGED FROM THE TIMES.)

LEWES, TUESDAY, JULY 13.—The annual country meeting of the Royal Agricultural Society commences at this place to-morrow. Before the prize lists of implements and stock overtake us, and while we are still fresh upon the ground, it may be worth while to state shortly what the Royal Agricultural Society is, how it works, what good it has done, what its faults are, and how it may be made more useful for the future. The survey thus proposed is rendered the more appropriate at the present moment when the last decisive battle between Free Trade and Protection is, with no doubtful issue, being fought to its close, and when some instruction may be derived by contrasting the fruits of a great political contest with the unostentatious labours of a body of men endeavouring to develope the oldest, the most necessary, and perhaps the greatest, of the useful arts.

The Royal Agricultural Society of England was incorporated in 1839 for a variety of objects. It was to embody such information contained in agricultural publications, and in other scientific works, as had been proved by practical experience useful to the cultivators of the soil. It was to correspond with agricultural horticultural, and other scientific societies, both at home and abroad. It was to encourage experimental agriculture, to promote improvements in implements and in the construction of farm-buildings and cottages, to develope the science of agricultural chemistry, to ascertain the best means of eradicating weeds and of destroying insects injurious to vegetable life, to help the discovery and introduction of new varieties of useful plants, to raise the standard of education among the agricultural classes, to assist in improving the veterinary art, and to encourage the best modes of cultivation and the best breeds of stock, and, finally, to contribute as far as possible to the comfort and welfare of the labourer. It will be admitted that the society had a wide enough field of exertion thus opened up to it. Let us see how it went to work therein. Its operations may be collected from the privileges of membership (with a Journal published in half-yearly parts), the services of a consulting chemist, the town meetings of the council, at which lectures are read and discussions take place on all subjects of interest included within the scope of the society's charter, a library for reference, the annual country meetings, which include a show of stock and implements, and, finally, some advantages in connection with the Royal Veterinary College. The society may also claim such credit as is due to it for having promoted the Royal Agricultural College at Cirencester—an institution which may yet prove of great value in supplying an enlightened body of land-agents competent for the care of those important interests with which they are intrusted. The college, however, has now no connexion with the society, and is merely mentioned incidentally. Of the different means thus adopted by the Society for the promotion of agriculture, the Journal is certainly one of the most valuable and successful. It has a circulation considerably in excess of the number of members in the society, notwithstanding that the gratuitous distribution to them raises the price to the public to an exorbitant amount. In this last respect the arrangements do not appear to be at all on a satisfactory basis; and the Council, if they do not speedily make some change, may find private enterprise depriving them of a means of usefulness which cannot be too much prized. There are hundreds of farmers who would willingly become subscribers for the Journal if the sale of it had not been converted into a practical monopoly for the purpose of securing additional members. The price of each part is 10s., so that in the year the general public are mulcted for it as much as if they had joined the society. Of the value of this periodical in the information which it contains it is difficult to speak too highly. Its pages possess an interest which will often prove attractive to the least professional reader; and while visionary theories are rejected on the one hand, and the bigotry of routine discountenanced on the other, the successful applications of science to practice are elucidated with the greatest care and by the best authorities. Take, for example, the two parts issued last year as specimens. The first opens with an article on agricultural chemistry by Mr. Lawes, of Rothamstead, and Dr. Gilbert; Mr. Pusey writes an account of M'Cormick's reaping machine, and Professor Way treats on superphosphate of lime, and Mr. J. A. Clarke gives an excellent account of the farming of Lincolnshire. In the second part, Mr. Lawes is again found recording an elaborate series of experiments on the comparative fattening qualities of different breeds of sheep. There is a very remarkable essay by Mr. Joshua Trimmer, on the Agricultural Geology of England and Wales—one which opens up an entirely unexplored field of science, and which, pursued in conjunction with Professor Way's researches into the different qualities of soils, will no doubt yet throw very extensive light upon the practice of agriculture. The part concludes with a report, drawn up by Mr. Pusey, on the agricultural implements in the Great Exhibition. Copious extracts from that report were published in the *Times* when it first appeared, and the whole forms a most comprehensive statement of the valuable and increasing aids which

the mechanical ingenuity of the age is so rapidly placing at the disposal of the cultivators of the soil. No person who refers to that report, or to the able lecture delivered on the same subject before the Society of Arts by Professor Wilson, can fail to be struck with the progress which has been made, and is still making, in this direction, and Mr. Pusey puts the practical results at once truthfully and well, when he says that "the efforts of agricultural mechanists have been, in all the main branches of farming labour taken together, to effect a saving on outgoings of little less than one-half;" that the new mechines have, in addition to that saving, "the merit of very great cheapness," and that they "have given to farming what it most wanted, not absolute indeed, but comparative certainty." Looking back to the few years during which the Journal has been in existence, one cannot help being struck with the freshness and value of the information which it has conveyed. Every new fact or practice connected with agriculture and included in the scope of the society's objects, has found therein a ready medium of publicity. The state of cultivation in each county, and the capabilities of the soil, have been carefully described, experiments have been minutely detailed, and the peculiar systems of widely separated districts, and even countries, recorded for the common benefit and instruction of all. The catch-water meadows of Devonshire, the warp lands of the Trent, the great level of the Fens, drained by windmills and steam-engines, are, perhaps, among the most remarkable developments of English agriculture; and it is reassuring, in times of distrust like those which we have lately passed through, to have the attention directed to results which, through many difficulties, and pursued during a long course of years, enterprize and energy have achieved.

The employment of a consulting chymist by the society adds greatly to the usefulness and dignity of its labours; for, however the ignorant may deride the still obscure teachings of chymical knowledge, a time will come, and is already more than foreshadowed, when the laboratory will form a usual appurtenance of the farm, and when scientific analysis and experiment shall supersede the rule of thumb, by which our fields have been cultivated and our food supplied. The society has felt and still feels all this. Besides those elaborate investigations into the qualities of manures and of soils to which we have already adverted, and which have yielded practical results of the highest value, many examples may be found in the records of the society's proceedings of the unexpected aids which chymistry affords. We may quote as an instance the treatment of flax straw as a substance adapted for manufacture; but the most remarkable proof of the interest felt in this department, and the large expectations entertained from it, is the announcement made a few days ago that the Society would confer a prize of £1,000 for the discovery of an artificial manure as fertilizing as Peruvian guano, and apable of being sold at £5 per ton. Such a discovery is not deemed impossible, and yet the effect of it would be an average increase of production which Mr. Hudson, of Castleacre, told the Earl of Derby recently would be more than equal to any protective duty the Government could place upon corn.

The town meetings of the council, and the lectures which are read and the discussions which arise therein, form a prominent feature of the Society's means of action. The subjects treated usually possess the interest of novelty, or of circumstances which have arisen to fix attention upon them. Here the business of the society is chiefly conducted by the most active and enterprising landowners and farmers, their continuance in the council being made dependent, to a large extent, upon the punctuality with which they attend the proceedings. So far the result is satisfactory, and the working of the society efficient; but it is a necessary consequence of the present constitution of the council that its members have facilities for remaining in office to a degree incompatible with that character for freshness and vigour which should mark the governing bodies of voluntary associations like this. Let an impression once get abroad that the affairs of such an association have fallen into the hands of a clique, and farewell to its usefulness. The Royal Agricultural Society has been more open to this charge than it is at present, and, we believe, perceives its own danger with regard to it. The ordinary meetings of the councils at Hanover-square necessarily command no great variety in the attendance; but means might be adopted, by the formation of committees from the general body of members on special subjects, or by a union with the local societies, similar to that which has recently been organized by the Society of Arts, for giving all parts of the country a practical share in the operations of the society, and thus enlisting them by their own services in the cause of agricultural progress. A few of the leading farmers of England are active members of the society; but the great majority still regard it as a landlord's institution, given over to an amateur spirit of improvement, and comparatively regardless of those economical considerations from which practical men cannot afford to have their attention diverted. This we believe to be a narrow-minded view of the objects of the society, but as long as it exists a great barrier of opinion and feeling is presented to its usefulness. Such facts do not escape observation, as the large proportion of members in the council who come from the very county in which the present year's meeting is held.

Wednesday, July 14.—Between the excitement of a contested election and preparations for the agricultural show, the inhabitants of this usually quiet town are thrown into no small state of bewilderment. They have decorated their streets with banners and evergreen arches. In the neighbourhood of the yard long lines of tents for refreshments have been erected, and from the depths of some of these proceed sounds indicating a due desire to keep the occasion joyously and mirthfully. Everybody in the place seems astonished that it should suddenly become such a centre of attraction, and all appear to feel impressed with the necessity of carrying the town creditably through so momentous an epoch in its history. Nor is there any reason to doubt that their efforts in this direction will be crowned with complete

success. The scorching heat of the weather will deter some, and the cares of electioneering will absorb others; but there is no reason to fear that these drawbacks, or the retired position of Lewes, will interfere seriously with the success of the show. To-day, it is true, the attendance has not been encouraging: but to-morrow, which is the great day, it is hoped will go off well. So intense was the heat during the afternoon that not even a squeak could be heard from the pig-pens, and half-a-dozen indefatigable game cocks and two Cochin-china fowls had a perfect monopoly of the noises usual in the stockyard. One could not help thinking that the blazing sun had succeeded in inspiring the animals of the society with something of that respect for his rays which, in tropical regions during the heat of the day, renders forests filled with wild beasts and birds, endless in the variety of their calls, as silent as the grave.

The proceedings of the society may be said not to have commenced till this morning, for, though Professor Simonds last night delivered an interesting lecture on the diseases of cattle, arising from parasites within or without the body, the implement yard was not opened till to-day, and the current of public interest will hardly have set in strongly until to-morrow. The display of implements justifies all the expectations entertained of it, and exhibits a decided advance in many important respects upon those of previous years. A list of prizes which is appended shows, that all the best and largest makers have been again in the field, and have maintained their already established positions. Messrs. Ransomes and Co., after a temporary indifference to these exhibitions, in which they long held a leading place, have re-entered the arena of competition this year with renewed energy and with proportionate success. The pre-eminence of their firm is maintained in the manufacture of the plough, which may be considered as being to other agricultural implements what "the Queen of weapons" is to arms. Messrs. Garrett and Son, while they divide with Hornsby and Son the prizes for drills, and with Messrs. J and F. Howard those for horse-hoes, extend the reputation of their firm, first, by some very valuable improvements in the construction of Hussey's American reaping-machine, and, secondly, by exhibiting an entirely new manure-distributor—a machine very much wanted now that guano and other substances of an expensive character are so extensively used as dressings. The importance of this invention will be readily understood when it is remembered that 10s. worth of seed corn is sufficient for an acre of land, and that, with reference to that outlay, drills have come into general use; whereas, for light artificial manures, laid on at a cost of 30s. per acre, no mechanical facilities have hitherto existed for distributing them equally. It seems odd that the list of prizes awards only a paltry sum of £5 for so useful a machine. Messrs. Hornsby and Son distinguish themselves most in the portable steam-engine shown by them, which exhibits a very remarkable economy of fuel, consuming only 4¾lbs. of coal per horse-power per hour. This may appear incredible to many engineers, but the experiments which prove the fact have been conducted under the personal superintendence of Mr. Amos, the society's consulting engineer, and cannot be doubted. The immense improvements effected by Messrs. Hornsby and other makers in the construction of these portable steam-engines have removed some of the objections which the advocates of fixed engines have urged against them, and it cannot be doubted, from the increasing spirit of competition which is every year shown in reference to them, that they are approved by many of our most enlightened agriculturists. Mr. Crosskill, of Beverley, maintains his long-established position in the society's show-yard, though his name figures less prominently than usual in the prize list. Outside the show-yard Mr. Fowler exhibited to-day his draining plough, which now acts admirably, and for the flat and clay land districts of the country escpecially is a machine of the highest importance and value. The inventor deserves great credit for the steady way in which he has brought this clever adaptation of the principle of the old mole plough into practical bearing—persevering through many difficulties, and at length receiving an acknowledgment of his success from the most sceptical. Witbin the last three months he states that his machines have ploughed 2,000 acres of land, at a price varying from 25s. to 42s. per acre, without tiles; the relative cost of the same work done by hand labour being from £3 10s. to £5 10s., so that the saving effected is very considerable. Mr. Fowler thinks that in districts of uniform stiff soil, like the Boothings of Essex, tiles may be dispensed with, for the mole in passing through the ground makes a pipe drain perfectly efficient for many years, and in 12 years the interest on the price of the tiles will come to more money than the cost of redraining. For grass lands this machine presents extraordinary advantages, penetrating as it does to a depth of from 3 to 4 feet, and depositing the tiles with far more accuracy and firmness than is possible by manual labour, without the slightest injury to the sward on the surface. In the thrashing-machines some important improvements have been effected, and that exhibited by Messrs. Clayton and Shuttleworth finishes and weighs the corn in a state fit for the market. Among the minor novelties and improvements of the present show may be mentioned a very excellent chaff-cutter, exhibited by Messrs. Richmond and Chandler, of Salford, which effects a saving of power of not less than from 40 to 45 per cent. There is a small but interesting show of dynamometers, including those of Bentall and Morin; and attention is directed to these instruments because the use of them, first introduced by Mr. Amos, has tended greatly to remove any suspicions of partiality in nearly all the most important departments of the implement-yard. A mechanical test is, as the lawyers say, "without prejudice;" and the society may fairly be congratulated on having that test, for nothing short of it would satisfy. Looking at the implement-yard as a whole, one cannot help being impressed with the enormous aids held out therein to practical agriculture. Thirteen years of experience have exercised a most salutary influence on the description of machines brought forward, and,

whereas formerly there was much useless rubbish, now the practical requirements of the farm are taken as the true guides of invention. Perhaps no more remarkable evidence can be afforded of this than the case of reaping machines, of which no less than seventeen specimens are exhibited, the best makers being competitors. From among them, Messrs. Garrett and Son have deservedly borne away the palm, not only by their selection of Hussey's machine, demonstrating its superiority over that of M'Cormick, which gained the council medal at the Great Exhibition last year, but introducing a very simple improvement in the construction of the scissor-like knives, which is thus described in the catalogue:—

"In the machines brought over from America the cutters were bevilled on both sides, similar to a common axe, which was found—in cutting soft crops, such as barley and oats—to have the effect of bending the straw between the guards in which the cutters work, and pulling it off instead of cutting it. By the improved form of cutter, registered by R. Garrett and Son, bevilled on one side only, and cutting against a keen square edge guard made of steel, similar to a pair of shears or scissors, this defect has been completely remedied, and crops of any kind may be perfectly cut with equal precision and facility. It is adapted for lands ploughed flat, as well as for stetches or ridges, and may be worked either lengthways or across the furrows, as required."

This wonderful machine promises to effect a complete revolution in our harvesting operations, for it cuts every description of standing crop with an evenness and regularity unknown to hand labour, and it works at the rate of an acre and a-half per hour; so that, in addition to the mere economy of money, there is the equally important one of time, a farmer being rendered far less dependent on those two very precarious things, harvest weather and harvest hands, than he used to be. The attention which this machine has attracted is one of the most favourable and encouraging signs that have yet been displayed of the increasing intelligence and enterprise among the agricultural body. It is calculated that, within the year, 1,500 of them have been made to order in this country — a sale of a new implement quite unprecedented. Another impression which must be produced on the mind of every attentive visitor to the show-yard of the Royal Agricultural Society is the extraordinary attraction which the manufacturers of machinery for the use of the farm feel and own towards these annual exhibitions. At great expense, they continue year after year to compete with each other; and so strong is the spirit of rivalry which pervades them, that a blacksmith (not long ago in a very small way in this neighbourhood) exhibits goods to the value of £2,000. Many of these men, who now employ hundreds of hands, commenced business like this blacksmith, and they have risen by degrees till their business at length embraces a variety of mechanical details, and calls forth an ingenuity which makes it not only an important branch of our national industry, but a prominent feature in that great system of labour economized by machinery, which is the chief source of our wealth as a people.

In concluding this notice of the Implement-yard, it is due to the two stewards, Mr. Fisher Hobbs and Mr. Hammond, to speak favourably of their praiseworthy exertions and successful arrangements.

THE GREAT ANNUAL DINNER.

The attendance at the show-yard on Thursday, July 15, was much larger than the peculiar circumstances under which the exhibition takes place in the present year, could have reasonably led any one to expect. The arrivals of visitors commenced with early dawn, and in spite of the broiling rays of the sun, and the attractions of a contested election for the county, vast numbers of persons were whisked into the town of Lewes by the railway trains from various directions, and a rare scene of excitement and an unwonted amount of bustle and animation ensued thereon. At four o'clock the great pavilion dinner of the members of the society was held —the Earl of Ducie, as president, occupying the chair, and the Earl of Chichester the vice-chair. Upwards of 800 gentlemen partook of the banquet, and at the high tables we observed—

The Earl of Ducie, president; the chief officer of Lewes, Viscount Palmerston, his Excellency the Chevalier Bunsen, his Excellency the Hon. Abbot Lawrence, the Right Hon. Sir John Pakington, Bart., M.P., the Earl of Carlisle, his Excellency the Marquis d'Azeglio, his Excellency the Baron Bentinck, Major General Sir Harry Smith, Bart., his Excellency General Count Groeben; the Earl De la Warr, Lord Walsingham, the Earl of Sheffield, Lord Berners, Lord Hastings, the Earl Talbot, Count Perponcher, the chairman of the Maryport and Carlisle Railway, M. Richard von Holtzendorf-Viel-Mansdorff, Mr. Hampton Langston, M.P., chairman of the South Eastern Railway, Mr. Chaplin, M.P., chairman of the South Western Railway, Mr. Fay (from the United States), the chairman of the Eastern Counties Railway, Mr. E. Vernon Harcourt, Sir Edward Baker, Bart., Mr. Davey (late chief officer of Lewes), the Earl of Leicester, Viscount Gage, Sir Henry Shiffner, Bart., Colonel Davies, the High Sheriff of Sussex, Professor Simonds, Professor Way, junior chief officer of Lewes; Captain Stanley Carr, Sir Archibald Macdonald, Bart., Captain Hepburn, Baron Martens, Mr. Lower (late chief officer of Lewes), Mr. Wood (of Culmington), Lord Rivers, M. Malezieux, Captain Mark Huish, Mr. C. A. Saunders, Mr. R. Moscley, Mr. Slight, Mr. Sturt, Mr. Bridgeman Simpson, the Earl of Darnley.

The Hon. R. H. Clive, M.P., Sir J. V. B. Johnstone, M.P., Mr. W. Shaw, of London, and Sir J. V. Shelley, M.P., acted as stewards of the dinner.

Grace having been said,

The noble President rose and gave "The Health of her Majesty the Queen, as Patroness of the Royal Agricultural Society of England."

The toast was drunk with three times three and one cheer more.

His Lordship then gave "The Health of Prince Albert, as 'one of us—a British farmer' (cheers); the

Prince of Wales, and the other Members of the Royal Family" (loud cheers).

The noble CHAIRMAN next called upon the meeting to drink a bumper to the health of the representatives of foreign countries, who had done honour to that anniversary by their presence. He (Lord Ducie) felt thankful to the great Disposer of all events that, at this moment, such a cordiality and such harmony existed amongst all civilised nations, as enabled so many representatives of foreign states to be present (cheers). With this toast he was delighted to couple the name of a distinguished individual who, while he was an honest and efficient servant of the crown he represented, had endeared himself to all classes in this country by his earnest advocacy of many a work of charity and benevolence, by his skilful developments of science, and by his continual manifestations of religious piety (cheers). Before he mentioned the name of this much respected gentleman, he must say that the county in which they were assembled owed him a particular debt of gratitude, inasmuch as to him British fed South Down mutton had been introduced to the city of Hamburg (cheers). He meant the Chevalier Bunsen, the Prussian Ambassador, who had been rewarded very lately by the excellence of South Down mutton he had eaten in that city (cheers and laughter). With the toast also he would associate the distinguished names of Mr. Abbot Lawrence, the representative of the United States, and the Marquis d'Azeglio, the Sardinian Ambassador (loud and long-continued cheering.)

The Chevalier BUNSEN was received with loud and prolonged cheering. In returning thanks he described the interest with which he and his colleagues entered the show-yard yesterday, and examined the magnificent exhibition of cattle and the improved show of implements. There was nothing of politics at these meetings —politics were banished (laughter and cheers); but they felt that this was a great national, and he might add a great international, concern; it was a harbinger of peace and a sign of concord to the world, strengthening the feeling of relationship generally between man and man. With the same feelings they had entered this hall, where they saw united at this festive board, not landlords and tenants merely, but warriors and civilians, and statesmen of all political parties, meeting with the tenant-farmers for good and for great purposes. They had thus entered into the very heart and core of British life; and he was sure he would not be contradicted by his excellent colleague when he said that in the midst of all the efforts of their common brethren, the Anglo-Saxon race, there was nothing so important as agricultural improvement and progress. So it had been from the beginning. What was it that nerved the ancestors of the people of the United States, when they brought to a new hemisphere the honoured British name; what had made them strong, and able to govern themselves, but their devotion to the hardy and ennobling pursuits of agriculture? They were not a people who dug in the crevices of the rocks for dirty gold (laughter), but they solicited, as was done here, the innocent mother earth to yield her best blessings and her choicest fruits to the labours of the ploughshare (cheers). And no one knew better than his noble friend, the Sardinian representative, that it was the same on the other side of the Alps, and that it was agriculture which had made the men of Piedmont the brothers and colleagues of the Anglo-Saxon race in the determination to uphold their independence and liberty both in peace and war (loud cheers). And, though last not least, his own native country —the native home of the whole Anglo-Saxon race—the part of Germany which he now represented, the kingdom of Prussia, was more and more occupied with agriculture, and in all matters of improvement they looked to England for a model. There was also present with them to-day an individual who forty years ago had fought the battles of his country, who had fought side by side with some of their fathers, and it might be with some of themselves—certainly he had fought side by side with the noble duke (Richmond) whom he saw present (cheers)—he alluded to General Count Groeben, who had now exchanged his sword for a ploughshare, and who had come here to witness for himself the course of agricultural improvement. For himself, he had had the happiness of attending the meetings of the Royal Agricultural Society fourteen years ago, and he would never forget the kindness with which he was received. In fact, he was the spoiled child of the society (Hear, hear); and the kindness with which his observations were listened to made it impossible for him to shrink from the flattering duty that had been imposed upon him, which was to propose, "Prosperity to the Royal Agricultural Society of England" (cheers). After eulogizing the journal of this society, which he said was read with equal interest on the banks of the Rhine as on the Thames, and the value of the annual shows, he said that in his opinion they were carrying on a greater work still—they had brought the landlord, the tenant, and the labourer into a closer union than they had ever been in before. This process he had seen going on during the fourteen years that he had been acquainted with them. This was not a blessing for this country alone, but he believed it was intimately connected with the peace, the liberty, and the happiness of mankind all over the world (cheers). If all this were not enough, he might point to the fact that they had assembled in the middle of a great election, which, as was remarked by a great statesman, in any other country would have shaken the foundations of society, but here it scarcely ruffled the surface of its waters (cheers). They had met without any feeling of party heats or animosities (continued cheering). What might their efforts then be expected to be for the future? On this head he might appeal to the signs of the times, which appeared to him to have been assuming a particular significancy during the last two or three years. He wished to speak, not politics, but history. If he was not mistaken, more than one great emigration had taken place among nations, and had changed the face of the world. And now in the sister island they saw the same process of emigration again going on, almost systematically. Yet the people were not driven away by the force of man—for this country had given them just laws and an equal administration of justice (cheers). But in consequence of that

emigration the English farmer would come in (cheers), and with the English farmer would come English capital, English industry, English order, English respect for law, the beautiful confidence and trust of the English in each other, their determination to work and pull in the same direction—and there could be no doubt that English piety and love for the true religion would accompany them (cheers). In providing for this change in the face of that unhappy country, there were many agencies at work; but he looked upon this society as one of the most important of them. They had done much to extend the country on which they worked—not in extending it beyond the waves, though to some extent they had done that too—but did they not double the land when they doubled its productive power (cheers)? He was satisfied they would extend the same energy to Ireland, and therefore he said that this society had a great career before it. He proposed, "Prosperity to the Royal Agricultural Society of England" (cheers).

Sir J. Pakington, M.P., who on rising was greeted with general and prolonged cheering, said: My Lord Ducie—I beg leave, with your permission, to propose a toast which the committee have done me the honour of entrusting to my charge, and which I assure you I propose with the greatest possible pleasure. The toast to which I beg to call your attention is the "Health of our noble and excellent President, the Earl of Ducie" (loud cheers). My distinguished friend, the Chevalier Bunsen, who has just addressed you with so much ability, has remarked, in the course of his speech, that anything like party politics is banished from meetings like the present (Hear). I assure you that not one word shall fall from me in contravention of this excellent, and, indeed, most necessary rule; and I am happy to say that we must all feel that, although during the last few years there have been subjects upon which the friends of British agriculture have been divided in opinion, there have been also other subjects and other considerations, and those considerations connected immediately with the objects of this society and the objects of this great meeting, upon which every friend of the English soil and every friend of the British farmer has been cordially and entirely unanimous (cheers). We must all feel that the highest considerations of national policy—that the interest of the landowner and the interests of the tenant-farmer, all alike require that we should combine in devoting our utmost endeavours, by every possible improvement in agriculture, by every possible exercise of agricultural skill, to produce from our soil the largest crops which it can bring forth (Hear, hear). Such I believe to be the object of this admirable society; and I am sure you will agree with me, that no men are so fit to preside from time to time over these annual meetings as those who have rendered themselves conspicuous by their exertions in the cause of agricultural science, and that I am not indulging in the language of mere compliment—that I am saying no more than is required by the strictest justice and the most rigid truth, when I say that amongst those who have cheered the British farmer by good example, and contributed to the science of agriculture the greatest possible amount of skill and the most liberal expenditure of capital, there are few, if any, who stand so conspicuously eminent as our noble chairman, the Earl of Ducie (loud and vehement plaudits). It is very fortunate to live in a county adjacent to that which has the benefit of claiming Lord Ducie among its resident proprietors; and I can assure the noble earl that the reputation he has acquired by his model farm, and by his exertions in procuring the construction of the best implements, is not confined to the county of Gloucester. We hear much of those exertions in the county of Worcester. His fame is spread throughout the length and breadth of the land (loud cheers). And I believe there is no man who could be more properly selected on account of his great exertions in the cause of agriculture, his skill in that science, and the improvements he has introduced, to preside over a meeting like the present (cheers). I will detain you no further—I know you will concur with me in this just eulogium upon the example which Lord Ducie has set to all who are connected with the land, and I ask you to join with me in drinking, with three times three, "The Health of the Noble Earl," with our best thanks to him for presiding over us on this occasion (loud cheers).

The toast was drunk with all the honours.

The President returned thanks, remarking facetiously that the colonial experience of the right hon. gentleman had had a perceptible effect in sweetening his compliments (cheers and laughter). With regard to the show, he might say that in his opinion the cattle were about the average, while the implements were decidedly something more. He believed that there never had been before so useful and so instructive an exhibition of implements (cheers), and that if he were to take a practical farmer and a practised engineer through it, the one would not be able to suppress his astonishment at the wonderful adaptation of the implements to his wants, whilst the other would be equally surprised at the simplicity and perfection of their mechanism (loud cheers). The only drawback which he (Earl Ducie) saw in the show was the state of fatness to which some of the animals were brought. He had not heard of any stock which had become beef since the assembling of the exhibition, but he had heard of many pigs that had become pork (laughter). This exhibition not only drew together the best animals, but the best purchasers; and, if they were disappointed in their purchases, they would soon cease to come (Hear, hear). The advantage of showing the animals in a more natural state hardly required an argument; and, as it was scarcely fair to ask the judges to act positively in this matter, seeing that the public had a prejudice in favour of fat, he should therefore suggest having a store stock class (cheers). The purchasers would go to that class; and where the money went, there the breeders would gather together (cheers). This society had done its best to promote the progress of agriculture, and nothing had tended more to that object than the admirable lectures of Professors Way and Simonds, a summary of which was so admirably given in the society's journal, by that right-hand man of the society, Mr. James Hudson (cheers). The council had, he was happy to say, turned its attention to the enormous

price paid by farmers for guano (Hear). A deputation had lately waited on the Prime Minister with reference to this subject. It had been most courteously received, and Lord Derby had promised to do all in his power. He (Earl Ducie) did not, however, believe that that "all" amounted to much, as the noble lord on his left (Viscount Palmerston) had, when in office, been often applied to on the subject, and had expressed the same incapacity. The society, therefore, had taken the matter into their own hands, and proposed a premium of £1,000 and a gold medal for the production of a manure of equal value with guano (cheers). If the price of that manure could be reduced one-half it would be the greatest boon that could be conferred on the farmer (cheers). He had only one other remark to make, and that was that the prizes for poultry were not offered for fancy, but for useful, birds, in order to open a new source of profit to the tenant-farmer (cheers).

Lord WALSINGHAM proposed the toast, "Prosperity to agriculture, manufactures, and commerce," interests which he held to be mutually dependent upon one another, and which he hoped would in future pull better together than they had yet done. But it could not be denied that the foundation of them all was agriculture. Who ever heard of the establishment of a manufacturing colony (cheers and laughter)? It was not till agriculture had prepared the way, and provided the raw material, that manufactures and commerce could flourish (applause).

The toast having been cordially drunk,

Lord PALMERSTON rose, and was received with vociferous applause, which was renewed several times after silence had been established, and when he was about to speak. He said—My Lord Ducie and gentlemen, I beg leave to propose a toast, which I am sure you will accept with pleasure, and drink with the greatest cordiality. I propose to you to drink "Prosperity to the borough of Lewes, and thanks to the worthy magistrate who has so greatly assisted the operations of this day." (Cheers.) I am persuaded, gentlemen, that those who have had to do with the management of the arrangements of this meeting will do ample justice to the authorities of Lewes, and will say that at no other place, and at no former period, were greater facilities afforded for the arrangements necessary for a meeting of this kind (cheers); and upon that account I am persuaded, independently of any other consideration, you will feel pleasure in offering your testimony of acknowledgment to the chief magistrate of the town of Lewes. But, indeed, gentlemen, this town has peculiar claims to consideration. For I believe it is one of the most ancient towns in the whole island. (Hear, hear.) I believe that it has traditions of historical events which carry back our recollection even to the time of the Romans. Now, gentlemen, the Romans, as we know, were a great people, unsurpassed in some things—in literature and the arts—a people who made great works. Those great works, indeed, were, as we have been told—

"Imperial wonders wrought by nations spoiled;"

and though we cannot, perhaps, surpass them in literature, or in the fine arts, yet I think we may boast that we have surpassed them in our public works. (Hear, hear). They could boast of nothing to compare with the railroads which multiply the communications of this country; and those railroads, instead of being the work of "nations spoiled," are the works of individuals who, I trust, have not been spoiled (laughter), but will be ample gainers by their investments. (Cheers and laughter). Now, gentlemen, the Romans also were great agriculturists, and I believe they drew great supplies of grain from this island. But to them was closed that wonderful book of knowledge which the scientific investigations of the present day have opened to you in that mysterious science of chymistry, which to them was an unknown book; and if ever there were a case in which it was true that "knowledge is power," that maxim is peculiarly true in reference to the aids which chymistry affords to agriculture. My noble friend has alluded to the question of guano, and he has mentioned what is perfectly true, that when I held an office which would have enabled me, if it had been possible, to assist the farmer with regard to guano, my endeavours proved fruitless. In fact, the Peruvians were not more disposed to let us put a price on their guano than the British farmer would be disposed to let them put a price upon his corn. (Great laughter). But, gentlemen, I cannot but think that the progress of chymical science, and the application of that science to practical agriculture, may lead you to something which will render you less anxious and solicitous about this same guano, and that instead of sending to the other end of the world for more manure for our fields, we shall find something nearly, if not quite, as good within a few hundred yards of our dwellings. ("Hear, hear," and cheers). Now, gentlemen, I have heard a definition of dirt. I have heard it said that dirt is nothing but a thing in a wrong place. ("Hear," and laughter). Now, the dirt of our towns precisely corresponds with that definition. (Hear). The dirt of our towns ought to be put upon our fields, and if there could be such a reciprocal community of interest between the country and the towns—that the country should purify the towns, and the towns should fertilize the country (laughter)—I am much disposed to think the British farmer would care less than he does, though he still might care something, about Peruvian guano (Hear, hear, and cheers). Now, we all acknowledge that there are certain laws of nature, and that those who violate those laws invariably suffer for it. Well, it is a law of nature that nothing is destroyed. Matter is decomposed, but only for the purpose of again assuming some new form, useful for the purposes of the human race. But we neglect that law (Hear, hear). We allow all decomposed substances in towns to pollute the atmosphere, to ruin the health, to produce premature misery, to be pestilent to life, and destructive of existence. Well, gentlemen, if, instead of that, there could be a system devised by which these substances, which are noxious where they now are, could be transferred so as to fertilize the adjoining districts, I am persuaded that not only would the health of the town populations be thereby greatly improved, but the

finances of the agricultural population would derive considerable benefit from the change. You all know, gentlemen—all who have attended to the subject and read recent publications must know—that for an expenditure per acre far less than that which produces one manuring of Peruvian guano, you may establish permanent arrangements by which, bringing from the towns fertilizing liquids, you would improve your property, and a permanent improvement would be made in the land at a far less expense than is now required to produce a single crop (Hear, hear). I therefore recommend you, gentlemen, to ponder the maxim that "knowledge is power;" and, as the diffusion of the most useful kind of knowledge is one of the main objects for which the Royal Agricultural Society was established, I am persuaded it will tend mainly and most efficiently to the advancement of the interest and the power of the agricultural class of the country (cheers). Now, gentlemen, there is only one other topic to which I shall take the liberty of adverting; and it is a topic which has already been alluded to by my respected friend the representative of the kingdom of Prussia. I remember to have read in a book published by a foreigner, who visited this country at a period when Parliament had been dissolved, an account of the dreadful disorders of an English election. Here we are, gentlemen, in the midst of an English election (Hear, hear), and I would ask any man who should have dropped from a balloon and found himself in the Showyard, and thence have come to this meeting, whether he could have supposed it possible that there was any topic of discussion or difference existing among the people of England ("Hear," and cheers). It is our good English rule, gentlemen, for men to shake hands before they fight (cheers, and laughter), and if they have no malice in their hearts they shake hands after the fight is over (renewed laughter). But, gentlemen, we are shaking hands in the midst of the fight (cheers and laughter), for during the elections—aye, and during the elections for the counties, which, for reasons that I shall not dilate upon, naturally excite a peculiar interest among those who have turned their attention to agricultural pursuits (great laughter); in the midst of the county elections, which take place all over England in the course of this week, here you have assembled men of all parties, differing upon every possible subject, and I would defy any man who came as a stranger among you to find any difference whatever, except as to the merit of some particular machine, or as to the over fatness or indifferent breeding of some animal which has been exhibited (cheers and laughter). Well, I say this is a glorious day, if on that account alone, for the Royal Agricultural Society, and it is a fine moral lesson given to the world, to show that Englishmen, however they may differ on subjects which are deeply interesting to them in a material point of view, yet can lay aside all their party animosities, and can meet upon common and neutral grounds, as brethren and as mutual friends, with no party but their country and no interest but that of the nation (loud and long-continued cheering). I now give you the "Health of the Chief Magistrate of Lewes."

Mr. NEAL returned thanks.

Lord BERNERS, in proposing the "Stewards of the Yard and the Judges of the Show," stated that the council had thought it necessary to appoint Professor Simonds to ascertain whether any animal introduced into the yard was suffering from infectious disease, and whether they exhibited any malformation. The labours of the judges themselves had been more onerous on this than on any former occasion, in consequence of the introduction of reaping machines, and the great number of steam-engines that had been brought forward. He had no hesitation in saying that better times were in store for agriculture, and that the Royal Agricultural Society would be one of the principal causes for introducing those better times, coupled with the great skill and the indomitable energy of the British farmer (cheers).

Mr. THOMPSON said: In returning thanks for the compliment that had been paid to the stewards and judges of the show, I beg to state that the great object of the stewards has been to make such arrangements as should secure to every exhibitor a fair field and no favour; and the judges have endeavoured to make their awards strictly in accordance with the merits of the animals or the implements brought before them. It will not be difficult to convince those who have visited the yard (and who has not?) that there has been a great deal of work to do, and in some classes considerable difficulty in arriving at a satisfactory decision; but the labour has been cheerfully gone through, and will be sufficiently rewarded if it is generally considered that the duties of the stewards and judges have been efficiently performed. The opinion they have formed respecting the general character of the show is, that though in the classes of shorthorns and Herefords the numbers are not so great as on some previous occasions, the horses, sheep, and pigs about make up the deficiency; and the quality of the stock in some classes is remarkably good, especially the Herefords, the female classes of shorthorns, some classes of Devons, and the Southdown sheep. In the implement department the stewards and judges are unanimous in thinking that the present is decidedly the best show that has yet taken place; that not only is there less rubbish, but that many of the standard implements have had important improvements made in them which add much to their value without at all increasing their cost. On the whole, therefore, it may be considered more than an average show. The facilities given by the town and neighbourhood deserve to be gratefully acknowledged by those who have taken any part in the arrangements; and I am only aware of one cause of complaint, viz., that the elements should have conspired with our good friends in Sussex, and lent their aid in giving an unusually warm reception. I wish now to call your attention to a few striking facts connected with my own department, which give strong evidence of the rapid improvement now going on in agricultural machinery, and its equally rapid rise in public estimation. Two of the most prominent features of the implement yard are the reaping machines and thrashing machines; and it is well

worthy of note, though not more than twelve months have elapsed since the first trial in this country of the present form of reaping machine, 1,400 orders have been received by four manufacturers of these implements, involving a cost of more than £30,000. These machines have been materially improved since last year, especially in the form of the cutting knives. As we are indebted to our American brethren for having sent us these machines in working form, I wish to point out the exact nature of our obligation to them. Nearly twenty years ago I saw a reaping machine at work in Scotland, which did its work fairly; and so far back as 1816 a machine was constructed in the north of England, not very dissimilar in appearance to the present machines, the maker of which, not being patronized here, emigrated to America. The question will naturally be asked how it happened that they were not further improved and brought into general use in this country, but were adopted and put into better form in America. I believe that the higher price of produce here, and the greater scarcity of labour there, will explain this fact. If the use of this machine in its less perfect state caused a loss of a bushel of wheat per acre, worth in this country 7s. per bushel, the loss was greater than the gain; whereas, the waste of a bushel of wheat in America, worth on the farm 2s. 6d., would be abundantly compensated by the saving of manual labour, avowedly the most expensive item in American farming. In saying thus much, I am far from wishing to undervalue the improvements made in the machine by our Transatlantic brethren, but merely that the case should be understood. I consider it not as a cause of jealousy, but as an additional bond of union between us; long may such ties continue in full force, and long may our only rivalry consist in striving which nation can most readily adopt that which is good in the sister country, and which can most quickly send it back again better than it came. The next greatest improvement is in the thrashing machines. The best machines exhibited on this occasion have made a decided step in the right direction, viz., in reducing the cost of preparing the grain for market. A few days ago I had the pleasure of seeing at work on the farm of a neighbour in Yorkshire, a thrashing-machine made by Messrs. Clayton and Shuttleworth, and the owner of the farm informed me that this machine thrashed, winnowed, and weighed the corn into sacks at a cost of 1d. per bushel. Now, by the old process of flail and winnowing machine, the cost would have been on an average about 6d. per bushel, making a difference of 12s. 6d. per acre on a crop of 30 bushels merely in preparing the corn for market. No long period has elapsed since the time when, throughout a large district, not many days' journey from the fair town of Lewes, if any farmer was rash enough to set up a thrashing-machine he was pretty sure to receive notice of a speedy visit from a certain Captain Swing; whereas at the present time it is difficult to find a farm of any size where a thrashing machine is not used. Twenty years ago the flail was universally recognized as one of the standard emblems of agriculture; in twenty years more, if any-one curious in antiquities should wish to see a flail, he will have to seek it in a museum, where it may possibly be found side by side with the bows and arrows of the ancient Britons, or other similar relics of by-gone days. These proofs of rapid progress might be extended to considerable length, but I will confine myself to one which I should be sorry to omit, because it involves a principle of importance, viz., the adaptation of the more important implements to the means of small farmers. Three years ago we were told it was impossible to reduce the price of the better class of implements; but we live in an age which makes us doubt whether the word impossible ever ought to have been admitted into the English language. Messrs. Garrett have this year brought out a drill, small but effective, and at such a price as really to bring it within the means of small occupiers. This step having been taken, I trust its success will be such as to lead to its being generally followed by the other implement makers. I beg to express our sincere thanks for the compliment that has been paid to the stewards and judges (applause).

The Earl of CARLISLE—My Lord Ducie and gentlemen, I am sincerely glad that the toast with which I have the high honour to be charged explains its own purpose, and carries with it its own recommendation. It is termed the "Labouring classes" (cheers). Now, if there is any one feature of the times in which we live which ought to give us peculiar gratification, and which I should be tempted to rank above those striking and marvellous improvements in the progress and science of agriculture, and, indeed, in every other branch of human industry and skill, that feature is the increase of thought, care, and honour which are bestowed upon labour and the labourers (cheers). With respect to labour, I believe it is every day more and more viewed and felt to be a Divine appointment—the Heaven-ordained means and main material of human worth, human happiness, and human virtue (loud cheers). With respect to the labourer, I feel there are few indeed who would not now recognize the truth that the workman should rank in value above the work—(Hear, hear)—that he should not, on the one hand, be considered by the merely feudal reckoning as an item in the retinue of the lord, or, on the other hand, in the mercantile light of a machine out of which so much work has to be extracted (cheers); but that as he does much for others, so others should do much for him (loud and prolonged cheering). I feel sure, to bind ourselves only to that fair county in which we are met, that, whether upon the breezy uplands of Goodwood, or under the castle keep of Arundel, or before the stately front of Petworth, not to mention other conspicuous instances, the matter which people now feel to be of real importance to inquire about is, not which is the greatest number of works of art, or the most splendid apartments, or the most costly furniture, but where the labourer is most cared for—(loud cheers)—where his dwellings are kept in the best repair, and where are the most efficient and well-conducted schools (renewed cheers). And, gentlemen, let me also remind you that the legislature itself has shown by a recent enactment that it entertains no unworthy jealousy of the English labourer (cheers). It has shown that it does

not scruple to put arms in his hands, and to entrust to him the defence both of our humblest and our proudest homes; and though at present we need entertain no apprehension of unfriendly intentions on the part of foreign nations, and though we are much more pleased to see their honoured representatives at such a friendly board as this—(cheers)—yet if, as upon this very southern shore of old first the Roman, next the Norman Conqueror did land—so, if any hostile forces should in future disembark, I know that we might trust to the men of Sussex to take the post of honour, and be the first to prove that if as invaders they came, as conquerors they should not depart (loud and reiterated cheering). But we all, as one man, feel that we had rather see them engaged in the honourable pursuits of peaceful industry than a horrible and bloody strife, even in the most righteous of causes, and I know it is with the sincerest of wishes for their real and permanent welfare that you will drink the toast of the labouring classes (cheers).

Mr. Abbot Lawrence then rose, and was received with reiterated cheering. He said, you know as well as I do that it requires no small share of confidence at this late hour, and after the intellectual treat which we have had from the great orators of your land (cheers), to rise even for the purpose of proposing a toast; but in the presence of British farmers I shrink from no duty imposed upon me (cheers). I rejoice in this opportunity of meeting British agriculturists on their own ground, because I believe, not only in England, but in every country of any consideration whatever, that life, and liberty, and property, and in fact the great foundations of society, rest mainly upon the agricultural classes (loud cheers). It is eminently so in Great Britain, particularly in England (Hear, hear). And why is it so? For one plain and simple reason. The owners of land reside on their land (cheers), and the owners and occupiers of land are neighbours and friends (cheers). They understand their mutual rights, they both assert them. I hear nothing of landlords oppressing their tenants; I hear nothing and see nothing of difficulties between tenant and landlord; and I take it for granted that landlords and tenants live in amity, and peace, and friendship (cheers). I do not, however, rise to make a speech, but to propose a toast (loud cries of "Go on"). That toast is one of very extensive significance, "The Agricultural Societies throughout the world" (loud cheers). And I give it with the more pleasure because I know that the Royal Agricultural Society of England, by its constitution, is only bounded by the horizon (loud cheers). I know your premiums are open to all the world. I know that my honoured colleagues on both sides of me (the Chevalier Bunsen and the Marquis d'Azeglio), representing farming countries, come hither to see your stock and implements; and I know that they can compete with yours (cheers). I say, then, that the science that has been, and is, applied to agriculture in England eventually spreads itself throughout the world by means of your society and those of other countries; and I therefore ask you to toast foreign societies (loud cheers). Three times have I had the honour of being invited to your meetings, and as this occasion may be the last (No, no), I beg to present my thanks to you and to the farmers of England, not only for the hospitality and kindness they have shown me, but for that oftentimes extended to my countrymen who cross the Atlantic, and visit every part of England to carry back your implements and your stock to the western world (cheers). I present to you the heartfelt sympathies of the farmers of the United States, and I hope and trust that the feelings of amity now so happily commenced between you may continue for ever (cheers). There never was any real reason for alienation between the two countries, and if I had my way, and if I could govern and regulate matters (cheers), with the aid of my friend here on my right (laying his hand affectionately on the shoulder of Lord Palmerston amidst the enthusiastic and reiterated cheers of the assembly) and with the kind feelings that I know exist in the heart of another eminent individual, who, now, occupies a place in the present Cabinet, we would, I say, never have wars or even rumours of wars (loud and long-continued cheers). I return you my thanks for the past; and if in the future we should, as I hope we may, meet again, we will not forget to sing "Auld Lang Syne" (great cheering).

The toast was then drunk with applause.

Mr. Shaw then proposed "The Railway Companies, and thanks for their co-operation in promoting the objects of the society" (cheers).

Mr. Chaplin, M.P., returned thanks.

The Earl of Chichester, who was in the vice-chair, then proposed the health of the President elect, Lord Ashburton (cheers), and apologised for his absence.

The toast having been duly honoured, a general cry arose for the Duke of Richmond, who however had previously left the pavilion, and the proceedings terminated.

Friday, July 16.—The proceedings of this year's country meeting terminated to-day, and in a pecuniary point of view the results are less satisfactory and successful for the Society than they have been for many years past. Partly owing to the situation of Lewes, which certainly was not a happy selection as the scene of such a display; partly owing to the extreme heat, which rendered locomotion, even in its most convenient forms, oppressive, and sight-seeing, however attractive, a bore; chiefly, however, on account of the elections, which naturally pre-occupied everybody's attention, this show has gone off with less than the usual *éclat*. Not more than 5,000 people visited the yards yesterday, and to-day the numbers could not have much exceeded 15,000, though the charge for admission was only a shilling, and stock and implements were both on view. There was no crowding round favourite animals or novel machines, no dexterous and eager handling to ascertain the prospective qualities of beef, mutton, or pork; no twisting of tails, poking of sides, and other devices to make recumbent prizes stand, pigs squeak, and penkeepers sullenly indignant at the exactingness of public curiosity. A languid listlessness pervaded both the animals and their visitors; the shaded sides of the stalls were alone frequented; people sauntered about the yards, turning gratefully to every puff of wind that blew; straw hats and "wideawakes" of the coolest construction abounded, and it was no unusual spectacle to see pigs and their keepers snoozing comfortably together under the shelter of the tarpaulin. Natural laws cannot be violated with impunity, as Lord Palmerston rightly said yesterday, and some of the overfattened beasts died from the excessive heat, or were

killed to save them the trouble. One immense Southdown ram, a victim of sun stroke, weighed no less than 48½lb. per quarter. A remarkable effect of the weather was its tendency to send the country wights into the refreshment booths rather than the showyard. The former were largely patronized by the smock frocks, who seemed to think their contents wonderful and far more desirable than the accumulated triumphs of the stock breeder and the implement maker. The truth would seem to be that, apart from the unfortunate concurrence of the elections, Lewes was an injudicious selection as the site for the Society's country meeting. Brighton would have been a far more convenient and appropriate choice. Standing midway between the eastern and western divisions of the county, its position would have enabled the Society to do justice to both, while the extensive railway accommodation would have been a great facility to visitors, and the proximity of the sea would have helped people to keep themselves cool. Instead of this, the society and its friends have been doing penance for a week on the side of a chalk hill, singularly well placed to develope the full force of the sun, in a quiet country town, undisturbed by any ambition of progress, and with a miserable little temporary railway station at command—where the arrangements were not very good nor the officials over obliging. The worthy inhabitants of Lewes did the best they could under the circumstances however, and the society, while it has gained little financially, has fairly sustained its reputation for utility. It would serve no purpose to re-enter upon the distinctive features of the show yard, as these have already been described in sufficient detail; but to agriculturists the publication of the prize list for implements in a complete form will, no doubt, prove acceptable. The awards of the judges in this department were not finished till late last night, and not announced till this morning.

LIST OF PRIZES.

SHORT-HORNS.

JUDGES.—Messrs. JOHN GREY, WM. SMITH, and THOMAS SHORT.

Class I.—Bulls calved previously to the 1st of January, 1850, and not exceeding 5 years old.

First prize of 40*l.* to Mr. Thomas Crisp, of Hawkhill, near Alnwick, Northumberland, a 4 years and 4 months old short-horned bull, bred by himself.

Second prize of 20*l.* to Mr. F. H. Fawkes, of Farnley, near Otley, Yorkshire, a 3 years and 5 months old pure short-horned bull, bred by himself.

Class II.—Bulls calved since the 1st of January, 1850, and more than 1 year old.

First prize of 25*l.* to Mr. John Booth, of Killerby, near Catterick, Yorkshire, a 2 years and 1 month old short-horned bull, bred by himself.

Second prize of 15*l.* to Mr. John Kirkham, of Hagnaby, near Spilsby, Lincoln, a 2 years and 2 months old pure short-horned bull, bred by himself.

Class III.—Cows in-milk or in-calf.

First prize of 20*l.* to Mr. Charles Towneley, of Towneley-park, near Burnley, Lancashire, a 3 years and 2 months old pure short-horned in-milk and in-calf cow, bred by himself.

Second prize of 10*l.* to Mr. Charles Towneley, of Towneley-park, near Burnley, Lancashire, a 4 years and 4 months old pure short-horned in-milk cow, bred by Mr. Bannerman.

Class IV.—Heifers in-milk or in-calf not exceeding three years old.

First prize of 15*l.* to Mr. Richard Booth, of Warlaby, near Northallerton, Yorkshire, a 2 years and 5 months old short-horned in-calf heifer, bred by himself.

Second prize of 10*l.* to Mr. Charles Towneley, of Towneley-park, near Burnley, Lancashire, a 2 years and 10 months old pure short-horned in-milk and in-calf heifer, bred by Mr. Turner, of Ireland.

Class V.—Yearling Heifers.

First prize of 10*l.* to Mr. Charles Towneley, of Towneley Park, near Burnley, Lancashire, a 1 year and 6 months old pure short-horned yearling heifer, bred by himself.

Second prize of 5*l.* to Mr. Richard Booth, of Warlaby, near Northallerton, a 1 year and 5 months old short-horned yearling heifer, bred by himself.

HEREFORDS.

JUDGES.—Messrs. H. CHAMBERLAIN, H. TRETHEWY, and J. E. JONES.

Class I.—Bulls calved previously to the 1st of January, 1850, and not exceeding 5 years old.

First prize of 40*l.* to Mr. Edward Price, of the Court House, near Pembridge, Hereford, a 4 years and 5 months old Hereford bull, bred by himself.

Second prize of 20*l.* to the Right Honourable the Earl of Radnor, of Coleshill, near Faringdon, Berks, a 3 years and 4 months old Hereford bull, bred by Mr. Stedman, of Bedstonehall, Herefordshire.

Class II.—Bulls calved since the 1st of January, 1850, and more than 1 year old.

First prize of 25*l.* to Mr. George Brown, of Avebury, near Marlborough, Wilts, a 1 year and 6 months old Hereford bull, bred by Mr. Yeoman, of Stretton Court, near Hereford.

Second prize of 15*l.* to the Right Honourable Lord Berwick, of Cronkhill, near Shrewsbury, Salop, a 2 years 6 months and 3 days old Hereford bull, bred by his lordship.

Class III.—Cows in-milk or in-calf.

First prize of 20*l.* to the Right Honourable Lord Berwick, of Cronkhill, near Shrewsbury, Salop, a 3 years 7 months and 15 days old Hereford in milk and in-calf cow, bred by his lordship.

Second prize of 10*l.* to Mr. Philip Turner, of the Leen, near Leominster, Herefordshire, a 3 years 9 months and 15 days old Hereford in-milk and in-calf cow, bred by himself.

Class IV.—Heifers in-milk or in-calf not exceeding 3 years old.

First prize of 10*l.* to the Right Honourable Lord Berwick, of Cronkhill, near Shrewsbury, Salop, a 2 years 7 months and 17 days old Hereford in-calf heifer, bred by his lordship.

Second prize of 5*l.* to the Right Honourable Lord Berwick, of Cronkhill, near Shrewsbury, Salop, a 2 years 8 months and 24 days old Hereford in-calf heifer, bred by his lordship.

Class V.—Yearling Heifers.

First prize of 10*l.* to Mr. Walter Maybery, of Penlan, near Brecon, Brecknockshire, a 1 year and 9 months old Hereford yearling heifer, bred by himself.

Second prize of 5*l.* to the Right Honourable Lord Berwick, of Cronkhill, near Shrewsbury, Salop, a 1 year 6 months and 19 days old Hereford yearling heifer, bred by his lordship.

DEVONS.

JUDGES.—Messrs. THOS. HARTSHORNE, THOS. TOWNSEND and E. POPE.

Class I.—Bulls calved previously to the 1st of January, 1850, and not exceeding 5 years old.

First prize of 40*l.* to Mr. Samuel Farthing, of Stowey Court, near Bridgewater, Somerset, a 3 years and 6 months old pure Devon bull, bred by himself.

Second prize of 20*l.* to Mr. Thomas Bushby Morle, of Cannington-park, near Bridgwater, Somerset, a 3 years and 6½ months old pure Devon bull, bred by Mr. John Quartley, of Molland, South Molton, Devon.

Class II.—Bulls calved since the 1st of January, 1850, and more than 1 year old.

First prize of 25*l.* to Mr. James Hole, of Knowle-house, near Dunster, Somerset, a 1 year and 9 months old pure Devon bull, bred by himself.

Second prize of 15*l.* to the Right Hon. the Earl of Leicester, of Holkham, near Wells, Norfolk, a two years and 6 months old North Devon bull, bred by his lordship.

Class III.—Cows in-milk or in-calf.

First prize of 20*l.* to Mr. Samuel Farthing, of Stowey

Court, near Bridgewater, a 3 years and 4 months old pure Devon in-milk and in-calf cow, bred by himself.

Second prize of 10*l.* to Mr. James Quartley, of Molland, near South Molton, Devon, a 10 years and 6 months old pure North Devon in-milk cow, bred by himself.

Class IV.—Heifers in-milk or in-calf not exceeding three years old.

First prize of 15*l.* to Mr. Samuel Farthing, of Stowey Court, near Bridgewater, Somerset, a 2 years and 3 months old pure Devon in-calf heifer, bred by himself.

Second prize of 10*l.* to Mr. James Quartley, of Molland, near South Molton, Devon, a 2 years and six months old pure North Devon in-calf heifer, bred by himself.

Class V.—Yearling Heifers.

First prize of 10*l.* to Mr. George Turner, of Barton, near Exeter, Devon, a 1 year and 8 months old North Devon yearling heifer, bred by himself.

Second prize of 5*l.* to Mr. Wm. Baker, of Bishops' Nympton, near South Molton, a 1 year and 7 months old North Devon yearling heifer, bred by himself.

SUSSEX.

Judges.—Messrs. E. L. Franklin, Wm. Cox, and John Williams.

Class I.—Bulls calved previously to the 1st January, 1850, and not exceeding 5 years old.

First prize of 20*l.* to Mr. Arnold Denman, of Stoneham Malling, near Lewes, Sussex, a 3 years and 5 months old Sussex bull, bred by himself.

Second prize of 10*l.* to Mr. William Botting, of Westmeston, near Hurstperpoint, Sussex, a 4 years and 6 months old Sussex bull, bred by himself.

Class II.—Bulls calved since the 1st of January, 1850, and more than 1 year old.

A prize of 10*l.* to Mr. Josiah Pitcher, of Westham, near Easthourne, Sussex, a 1 year and 6 months old pure Sussex bull, bred by himself.

Class III.—Cows in-milk or in-calf.

First prize of 10*l.* to Messrs. Arthur and Thomas Barton, of Bexhill, near Battle, Sussex, a 6 years and 4 months old Sussex in-milk and in-calf cow, bred by themselves.

Second prize of 5*l.* to Mr. Henry Catt, of West Firle, near Lewes, Sussex, a 6 years and 4 months old Sussex in-calf cow, bred by himself.

Class IV.—Heifers, in-milk or in-calf, not exceeding three years old.

A prize of 10*l.* to Mr. Arnold Denman, of Stoneham Malling, near Lewes, Sussex, a 2 years and 5 months old Sussex in-calf heifer, bred by himself.

Class V.—Yearling Heifers.

A prize of 5*l.* to Mr. James Gorringe, of Selmeston, near Lewes, Sussex, a 1 year and 8 months old pure Sussex yearling heifer, bred by himself.

CATTLE OF ANY OTHER BREED.

Judges.—Messrs. H. Chamberlain, H. Trethewy, and J. E. Jones.

Class I.—Bulls calved previously to the 1st of January, 1850, and not exceeding 5 years old.

A prize of 10*l.* to Captain William Inge, of Thorpe Constantine, near Tamworth, Stafford, a 4 years and 5 months old long-horned bull, bred by Mr. Baker, of Rollright, Oxfordshire.

Class II.—Bulls calved since the 1st of January, 1850, and more than one year old.

A prize of 10*l.* to Mr. J. G. Watkins, of Woodfield, near Droitwich, Worcester, a 1 year and 4 months old Channel Islands bull, bred by himself.

Class III.—Cows in-milk or in-calf.

A prize of 10*l.* to Captain William Inge, of Thorpe Constantine, near Tamworth, Stafford, a 7 years and 2 months old long-horned in-milk cow, bred by himself.

Class IV.—Heifer in-milk or in-calf.

A prize of 5*l.* to Mr. William Tod, of Elphinstone Tower, near Tranent, Haddington, a 2 years and 11 months old West Highland in-calf cow, bred by Mr. M'Donald, of Inverness-shire.

Class V.—No entry.

HORSES.

Judges.—Messrs. Wm. Greaves, Thos. Capon, and W. F. Karkeek.

Class I.—Stallions for agricultural purposes, foaled previously to 1st January, 1850.

First prize of 30*l.* to Mr. William Stearn, of Elmsett Hall, near Hadleigh, Suffolk, a 3 years old pure Suffolk stallion, bred by Mr. Arthey, of Lindsey, Suffolk.

Second prize of 15*l.* to Mr. Samuel Claydon, of Linton, Cambridgeshire, a 3 years old Suffolk stallion, bred by himself.

Class II.—Stallions for agricultural purposes, foaled since the 1st of January, 1850.

First prize of 20*l.* to Mr. Thomas Catlin, of Butley, near Woodbridge, Suffolk, a 2 years old pure Suffolk stallion, bred by himself.

Second prize of 10*l.* to Mr. William Wilson, of Ashbocking, near Ipswich, Suffolk, a 2 years old Suffolk stallion, bred by Mr. James Garnham, of Earl Stonham, Suffolk.

Class III.—Roadster Stallions.

A prize of 15*l.* to Mr. John Baxter, of Wiggenhall, St. Peter's, near Lynn, Norfolk, a 4 years old roadster stallion, bred by himself.

Class IV.—Mares and Foals, for agricultural purposes.

First prize of 20*l.* to Mr. Nathaniel George Barthropp, of Crettingham Rookery, Woodbridge, Suffolk, a Suffolk mare and foal; the mare bred by Mr. R. Pease, of Laxfield; sire of foal belonged to himself.

Second prize of 10*l.* to Mr. Frederick Barlow, of Hasketon, near Woodbridge, Suffolk, a Suffolk mare and foal; the mare bred by Mr. Garnham, of Henley, Suffolk, and is 6 years old; sire of foal belonged to Mr. Wilson, of Ashbocking.

Class V.—Fillies, two years old.

First prize of 15*l.* to Mr. Samuel Wrinch, of Great Holland, near Colchester, Essex, a 2 years old Suffolk filly, bred by the Hon. and Rev. F. De Grey, of Copdock, near Ipswich

Second prize of 5*l.* to Mr. Samuel Wrinch, of Great Holland, near Colchester, Essex, a 2 years old Suffolk filly, bred by himself.

LEICESTERS.

Judges.—Messrs. W. Bartholomew, N. C. Stone, and W. Tindall.

Class I.—Shearling Rams.

First prize of 30*l.* to Mr. William Sanday, of Holme Pierrepoint, near Nottingham, a 16 months old Leicester ram, bred by himself.

Second prize of 15*l.* to Mr. William Sanday, of Holme Pierrepoint, near Nottingham, a 16 months old Leicester ram, bred by himself.

Class II.—Rams of any other age.

First prize of 30*l.* to Mr. William Sanday, of Holme Pierrepoint, near Nottingham, a 40 months old Leicester ram, bred by himself.

Second prize of 15*l.* to Mr. William Sanday, of Holme Pierrepoint, near Nottingham, a 28 months old Leicester ram, bred by himself.

Class III.—Shearling Ewes.

First prize of 20*l.* to Mr. William Sanday, of Holme Pierrepoint, near Nottingham, a pen of five 16 months old Leicester ewes, bred by himself.

Second prize of 10*l.* to Mr. William Sanday, of Holme Pierrepoint, near Nottingham, a pen of five 16 months old Leicester ewes, bred by himself.

SOUTH DOWNS.

Judges.—Messrs. Hart, Hy. Fooks, and P. Purves.

Class I.—Shearling Rams.

First prize of 30*l.* to Mr. Jonas Webb, of Babraham, near Cambridge, a 17 months old South Down ram, bred by himself.

Second prize of 15*l.* to Mr. Jonas Webb, of Babraham, near Cambridge, a 16 months old South Down ram, bred by himself.

Class II.—Rams of any other age.

First prize of 30*l.* to the Right Hon. the Earl of Chichester, of Stanmer, near Lewes, Sussex, a 40 months old South Down ram, bred by his lordship.

Second prize of 15*l.* to Mr. William Sainsbury, of West

Lavington, Wilts, a 29 months old South Down ram, bred by himself.

Class III.—Shearling Ewes.

First prize of 20*l.* to the Right Hon. the Earl of Chichester, of Stanmer, near Lewes, Sussex, a pen of five 16 months old South Down Ewes, bred by his lordship.

Second prize of 10*l.* to his Grace the Duke of Richmond, of Goodwood, near Chicheater, Sussex, a pen of five 16½ months old South Down ewes, bred by his Grace.

LONG WOOLS (NOT LEICESTERS.)

JUDGES.—Messrs. J. ABBOTT, H. AYLMER, and P. RICHARDSON.

Class I.—Shearling Rams.

First prize of 20*l.* to Mr. William Lane, of Eastington, near Northleach, Gloucestershire, a 16 months old Cotswold ram, bred by himself.

Second prize of 10*l.* to Mr. William Garne, of Aldsworth, near Northleach, Gloucestershire, a 16 months old Cotswold ram, bred by himself.

Class II.—Rams of any other age.

First prize of 20*l.* to Mr. William Lane, of Eastington, Northleach, Gloucestershire, a 40 months old Cotswold ram, bred by himself.

Second prize of 10*l.* to Mr. Robert Beaman, of Moreton-in-the Marsh, Gloucestershire, a 40 months old true Cotswold ram, bred by himself.

Class III,—Shearling Ewes.

First prize of 10*l.* to Mr. William Lane, of Eastington, near Northleach, Gloucestershire, a pen of five 16 months old Cotswold ewes, bred by himself.

Second prize of 5*l.* to Mr. William Lane, of Eastington, near Northleach, Gloucestershire, a pen of five 16 months old Cotswold ewes, bred by himself.

ROMNEY MARSH, OR KENTISH SHEEP.

JUDGER.—Messrs. J. ABBOTT, H. AYLMER, and P. RICHARDSON.

Class I.—Rams of any age.

First prize of 20*l.* to Sir Edward C. Dering, Bart., of Surrenden Dering, near Ashford, Kent, a 39½ months old Romney Marsh ram, bred by himself.

Second prize of 10*l.* to Sir Edward C. Dering, Bart., of Surrenden Dering, near Ashford, Kent, a 4 years and 3 months old Romney Marsh ram, bred by himself.

Class II.—Four-toothed Ewes with their lambs.

A prize of 10*l.* to Sir Edward C. Dering, Bart., of Surrenden Dering, near Ashford, Kent, a pen of five 2 years and 3 months old Romney Marsh ewes with their lambs, bred by himself.

Class III.—Ewes of any age.

A prize of 10*l.* to Mr. Walter W. Dawes, of Ewhurst, near Hurst Green, Sussex, a pen of five 4 years and 3 months old Romney Marsh ewes, bred by the late Mr. Thomas Dawes and himself.

PIGS.

JUDGES.—Messrs. W. HESSELTINE, J. CLAYDEN, and J. CLARKE.

Class I.—Boars of a large breed.

First prize of 15*l.* to Mr. Henry Blandford, of Sandridge, near Melksham, Wilts, a Berkshire boar, 2 years and 1 day old, bred by himself.

Second prize of 5*l.* to Mr. Moses Cartwright, of Stantonhill, near Burton-on-Trent, Stafford, a Stanton-boar, 1 year and 2 months old, bred by himself.

Class II.—Boars of a small breed.

First prize of 15*l.* to Mr. Samuel Druce, jun., of Eynsham, near Oxford, an Oxfordshire and Essex boar, 1 year and 2 weeks old, bred by himself.

Second prize of 5*l.* to Mr. Timothy Town, of Keighly, Yorkshire, a small boar, 3 years and 1 month old, bred by Mr. John G. Sugden, of Steeton Hall, near Keighley, Yorkshire.

Class III.—Breeding Sows of a large breed.

A prize of 10*l.* to Mr. William Abbott, of Woodhouse, Carr, near Leeds, Yorkshire, a large sow, 3 years and 9 months old, bred by Mr. John Madgley, of Mear Wood.

Class IV.—Breeding Sows of a small breed.

A prize of 10*l.* to Mr. Mark Stainsby, jun., of 30, Lady Pitt-lane, Leeds, Yorkshire, a Devonshire sow, 1 year and 2 months old, bred by Mr. John Bartlett, of Lifton, near Launceston, Devon.

Class V.—Breeding Sow Pigs of a large breed, above 4 and under 8 months old.

A prize of 10*l.* to Mr. Samuel Munro, of Salford, Lancashire, a pen of three large sow pigs, 7 months and 1 week old, bred by himself.

Class VI.—Breeding Sow Pigs of a small breed, above 4 and under 8 months old.

A prize of 10*l.* to Mr. John Moon, of Lapford, near Crediton, Devon, a pen of three Essex sow pigs, 7 months and 2 weeks old, bred by himself.

POULTRY.

JUDGES.—The Hon. and Rev. S. W. LAWLEY, Mr. J. BAILEY, and Mr. T. B. WRIGHT.

Class I.—Cocks and Hens of the Dorking, Surrey, or old Sussex or Kent breeds.

First prize of 5*l.* to Mr. Thomas Townley Parker, of Sutton Grange, St. Helens, Lancashire, a grey Dorking cock and two hens, 15 months old, bred by himself.

Second prize of 3*l.* to Mr. Henry Blandford, of Sandridge, near Melksham, Wilts, a speckled Dorking cock and two hens, 4 months and 2 weeks old, bred by himself.

Third prize of 2*l.* to Mr. James Lewry, of Handcross, Slaughham, near Crawley, Sussex, a Dorking cock and two hens, 5 months and 2 weeks old, bred by himself.

Class II.—Cocks and Hens of the Malay, Cochin-China, or other Asiatic breeds.

First prize of 3*l.* to Mr. Henry B. Higgs, of Hill-lodge, near Southampton, Hants, a Cochin-China cock and two hens, 5 months and 1 week old, bred by himself.

Second prize of 2*l.* to Mr. Henry B. Higgs, of Hill-lodge, near Southampton, Hants, a Cochin-China cock and two hens, 4 months old, bred by himself.

Class III.—Cocks and Hens of the Spanish, Hamburgh, or Polish breeds.

First prize of 3*l.* to Mr. George C. Adkins, of Edgbaston, near Birmingham, Warwick, a black Polish cock and two hens, about 12 months old, breeder unknown.

Second prize of 2*l.* to Mr. Joseph Tuley, of Matchless-house, near Keighley, Yorkshire, a golden-spangled Hamburgh cock, 26, and 2 hens, 14 months old respectively, bred by Mr. John Driver of Coln.

Class 4.—Cocks and Hens of any other pure breed.

First prize of 3*l.* to Mr. Joseph Tuley, of Matchless-house, Keighley, Yorkshire, a Bolton grey cock and two hens, 26 months old, bred by himself.

Second prize of 2*l.* to Mr. William Ludlam, of Bradford, Yorkshire, a pure silver pheasant cock and 2 hens, 24 months old, bred by himself.

Class V.—Cocks and Hens of any mixed breed.

A prize of 3*l.* to Mr. Henry Thomas Leigh, of Turnham-green, Middlesex, a golden bantam (of Sir John Sebright's breed) cock and two hens, about 24 months old, bred by himself.

Class VI.—Turkeys. No prize awarded.

Class VII.—Geese.

First prize of 3*l.* to Mr. Thomas Towneley Parker, of Sutton Grange, St. Helens, Lancashire, a Toulouse gander and two geese, 3 months and 2 weeks old, bred by himself.

Second prize of 2*l.* to Mr. Robert Glover, of Holt Hall, near Fazeley, Staffordshire, a white gander and two geese, age unknown, bred by the Rev. John Robinson, of Widmerpool.

Class VIII.—Ducks of the Aylesbury, or any other white variety.

A prize of 2*l.* to Mr. Robert Glover, of Holt Hall, near Fazeley, Staffordshire, a white Aylesbury drake and two ducks, about 2 years old, bred by him.

Class IX.—Ducks of any variety.

First prize of 2*l.* to Mr. Thomas Towneley Parker, of Sutton Grange, near St. Helens, Lancashire, a Rouen drake and two ducks, 12½ months old, bred by himself.

Second prize of 1*l.* to the Right Hon. the Earl of March, of Molcomb, Chichester, Sussex, a wild variety drake and two ducks, the drake 2 years, and ducks 10 months old, bred by his lordship.

COMMENDATIONS.

SHORTHORNS.

HIGHLY COMMENDED.—Mr. Richard Booth's cow and Mr. John Kirkham's heifer.

COMMENDED.—The Right Hon. Lord Feversham's bull, the Right Hon. Lord Berner's heifer, Mr. Charles Towneley's heifer, and Mr. Kirkham's heifer.

HEREFORDS.

HIGHLY COMMENDED.—Mr. Wm. Perry's bull, Mr. John Walker's bull, the Executors of the late Rev. J. R. Smythes' cow, and Mr. Walter Maybery's heifer.

COMMENDED.—Mr. Joseph Crsdock's bull, Mr. William James' cow, and the Executors of the late Rev. J. R. Smythies' heifer.

DEVONS.

HIGHLY COMMENDED.—Mr. George Turner's heifer.

COMMENDED.—Mr. Samuel Anstey's bull, the Earl of Leicester's cow, and Mr. James Hole's heifer.

SUSSEX CATTLE.

COMMENDED.—Mr. Robert Chatfield's bull and Mr. Themas Child's bull.

CATTLE OF ANY BREED.

HIGHLY COMMENDED.—Mr. R. J. Webb's bull and Mr. Wm. Tod's bull.

COMMENDED.—Mr. John Boswell's bull and Mr. G. D. Badham's bull.

HORSES.

HIGHLY COMMENDED.—Mr. H. D. Seymour's stallion and Mr. Thomas Addington's mare and foal.

COMMENDED. — Mr. Edward Browning's stallion, Mr. Jacob Watson's mare and fosl, the Hon. and Rev. J. Norton's filly, and Mr. N. G. Barthropp's filly.

SHEEP (LEICESTERS).

HIGHLY COMMENDED.—Mr. W. Sanday's ram, Mr. T. E. Pawlett's ram, and Mr. W. Sanday's ram.

COMMENDED.—Mr. Wm. Sanday's ram and Mr. T. E. Pawlett's rams.

SHORT WOOLLED.

HIGHLY COMMENDED.—Two of Mr. Jonas Webb's rams, Mr. Thomas Robinson's ram, Mr. Wm. Sainsbury's ram, Mr. Wm. Rigden's pen of ewes, and Mr. Henry Lugar's pen of ewes.

COMMENDED.—Mr. Wm. Sainsbury's ram, His Grace the Duke of Richmond's ram, and Mr. Thomas Ellman's pen of ewes.

ROMNEY MARSH SHEEP.

COMMENDED.—Two of Sir Edward Dering's rams.

PIGS.

HIGHLY COMMENDED.—Mr. Wm. Hewer's boar, Mr. Wm. Hainworth's boar, Mr. John Moon's boar, Mr. John Hillman's sow, Mr. Samuel Druce's (jun.) sow, Mr. George Mangle's sow, and Mr. John Moon's sow.

COMMENDED.—Mr. G. E. Taylor's boar, Mr. Samuel Umber's boar, Mr. James Gorringe's boar, Mr. Wm. Ludlam's boar, Mr. John Hillman's sow, Mr. Joseph Tuley's sow, Mr. Samuel Druce's (jun.) sow, Mr. W. M. Barber's sow, the Rev. E. Elmhirst's sow, Mr. Samuel Munro's sow, Mr. Wm. Barber's pen of sows, Mr. Robert Fooke's pen of sows, and Sir John Conroy's, Bart., pen of pigs.

POULTRY.

HIGHLY COMMENDED.—Mr. James Lewry's pen of Dorking fowls.

COMMENDED.—Mr. H. Blandford's pen of Dorking fowls and Mr. Wm. Ludlam's pen of fowls.

PRIZES FOR IMPLEMENTS.

For the plough best adapted for general purposes, 7*l*.—Messrs. Ransome and Co.

For the plough best adapted for deep ploughing, 7*l*.—Mr. William Busby.

For the best one-way or turnwrest plough, 7*l*.—Messrs. Ransome and Co.

For the best paring plough, £5.—Mr. Thomas Glover.

For the best subsoil pulverizer, £5.—Messrs. J. Gray and Co.

For the best drill for general purposes, £10.—Messrs. R. Hornsby and Son.

For the best steerage corn and turnip drill, £10.—Messrs. R. Hornsby and Son.

For the best drill for small occupations, £5.—Messrs. R. Garrett and Son.

For the best and most economical small-occupation seed and manure drill for flat or ridged work, £5.—Messrs. R. Garrett and Son.

For the best turnip drill on the flat, £10.—Messrs. R. Hornsby and Son.

For the best turnip drill on the ridge, £10.—Messrs. R. Hornsby and Son.

For the best drop drill, for depositing seed and manure, £10.—Messrs. R. Garrett and Son.

For the best manure distributor, £5.—Messrs. R. Garrett and Son.

For the best portable steam engine, not exceeding 6-horse power, applicable to thrashing or other agricultural purposes, £40—Messrs. R. Hornsby and Son; for the second-best ditto ditto, £20—Messrs. Barrett, Exall, and Andrewes.

For the best fixed steam engine, not exceeding 8-horse power, applicable to thrashing or other agricultural purposes, £20—Messrs. Barrett, Exall, and Andrewes; for the second-best ditto ditto, £10—Messrs. Ransome.

For the best portable thrashing machine, not exceeding 2-horse power, for small occupations, £10—Messrs. R. Garrett and Son.

For the best portable thrashing machine, not exceeding 6-horse power, for larger occupations, £20.—Messrs. Garrett and Son.

For the best portable thrashing machine, not exceeding 6-horse power, with shaker and riddle, to be driven by steam, £20.—Messrs. Clayton and Co.

For the best fixed thrashing machine, not exceeding 6-horse power, with straw-shaker, riddle, and winnower, that will best prepare the corn for the finishing dressing machine, to be driven by steam, £20.—Messrs. Garrett and Son.

For the best corn-dressing machine, £10.—Messrs. Hornsby and Son.

For the best grinding-mill for breaking agricultural produce into fine meal, £10.—Mr. Hurwood.

For the best linseed and corn-crusher, £5.—Mr. Stanley.

For the best chaff-cutter, to be worked by horse or steam power, £10.—Messrs. Richmond and Chandler.

For the best chaff-cutter, to be worked by hand-power, £5.—Mr. Cornes.

For the best turnip cutter, £5—Mr. Samuelson.

For the best oilcake breaker for every variety of cake, £5—Mr. Hornsby.

For the best one-horse cart for general purposes, 10*l*.—Mr. Wm. Busby.

For the best light waggon for general purposes, equal merit—Mr. Crosskill and Mr. W. Ball.

For the best machine for making draining-tiles or pipes for agricultural purposes, 20*l*.—Mr. T. Scragg.

For the best instruments for hand use in drainage, 3*l*.—Messrs. Mapplebeck and Lowe.

For the best heavy harrow, 5*l*.—Mr. Wm. Williams.

For the best light harrow, 5*l*.—Messrs. J. and F. Howard.

For the best cultivator, grubber, or scarifier, 10*l*.—Messrs. Ransome and Co.

For the best pair-horse scarifier, 5*l*.—Mr. Ch. Hart.

For the best horse-hoe on the flat, 10*l*.—Messrs. Garrett and Son.

For the best horse-hoe on the ridge, 5*l*.—Messrs. J. and F. Howard.

For the best horse-rake, 5*l*.—Messrs. J. and F. Howard.

For the best gorse-bruiser, 5*l*.—Messrs. Barrett, Exall, and Andrewes.

For the best and most economical steaming apparatus for general purposes, 5*l*.—Mr. W. P. Stanley.

For the best dynamometer, especially applicable to the traction of ploughs, 5*l*.—Mr. Bentall.

For the best plough to fill in the soil cast out of drains, with not more than four horses, two and two abreast (offered by Mr. R. S. Slaney, M.P.), 10*l*.—No merit.

MISCELLANEOUS.

Reaping machine, silver medal—Messrs. R. Garrett and Son.

Improvement in plough-wheels, silver medal—Messrs. J. and F. Howard.

Well machinery, silver medal—Messrs. Tasker and Fowle.

Digging-forks and farm tools, silver medal—Messrs. Burgess and Key.

Patent double mill for hand power, silver medal—Messrs. Ransome and Co.

THE FOLLOWING ARTICLES WERE HIGHLY COMMENDED:—Norwegian harrow, exhibited by Mr. Kearsley; American digging forks and farm tools, exhibited by Messrs. Mapplebeck and Lowe; combined broadshare and subsoil plough, exhibited by Mr. Bentall; reaping machine, exhibited by Mr. Crosskill; drill for general purposes, exhibited by Messrs. R. Garrett and Son; drill for turnips and mangold wurtzel on the ridge, exhibited by Messrs. R. Garrett and Son; portable steam engine, exhibited by Messrs. R. Garrett and Son; portable steam engine, exhibited by Messrs. R. Hornsby and Son; portable steam engine, exhibited by Messrs. Clayton and Co.; injecting instrument, exhibited by Mr. Read; eccentric lever hinges for gates, exhibited by Mr. H. A. Thompson; corn and seed drill, exhibited by Messrs. R. Garrett and Son; small weighing machine, exhibited by Messrs. Hill and Co.; window frame and fastener, exhibited by Messrs. Barnard and Co.; fixed steam engine, exhibited by Messrs. Hornsby and Son.

THE FOLLOWING ARTICLES WERE COMMENDED:—Haymaking machine, exhibited by Messrs. Smith and Ashby; sack holder, exhibited by Mr. Cooch; odometer, exhibited by Messrs. Cottam and Hallen; gravel screen, exhibited by Mr. John Smith, of Uxbridge; hurdle, exhibited by Messrs. Hill and Co.; root washer, exhibited by Mr. Crosskill; garden engine, exhibited by Mr. Read; American churn, exhibited by Burgess and Key; gate, exhibited by Messrs. Hill and Co.; hames, exhibited by Mr. H. A. Thompson; portable steam engine, exhibited by Mr. Eaton; patent trussed iron whippletrees, exhibited by Messrs. Ransome and Co.; one horse seed harrow, exhibited by Messrs. Holmes and Son; flax seeding machine, exhibited by Messrs. W. Dray and Co.; portable steam engine, exhibited by Messrs. Ransome and Sims; portable steam engine, exhibited by Messrs. Clayton and Co.; portable steam engine, exhibited by Messrs. Tuxford and Sons.

DRAINING PLOUGH.

The implement which attracted the greatest interest was the draining plough invented by Mr. Fowler, of Bristol. This plough was in constant operation in a field outside the show-yard during the whole day. We quote the following from Mr. Pusey's report of the agricultural implements shown at the Great Exhibition, addressed to his Royal Highness Prince Albert:—

"But for the American reapers, Mr. Fowler's draining plough would have formed the most remarkable feature in the agricultural department of the Exhibition. Wonderful as it is to see the standing wheat shorn levelly low by a pair of horses walking along its edge, it is hardly, if at all, less wonderful, nor did it excite less interest or surprise among the crowd of spectators when the trial was made at this place, to see two horses at work by the side of a field, on a capstan which, by an invisible wire-rope, draws towards itself a low frame-work, leaving but the traces of a narrow slit on the surface. If you pass, however, to the other side of the field, which the framework has quitted, you perceive that it has been dragging after it a string of pipes, which still following the plough's snout, that burrows all the while four feet below ground, twists itself like a gigantic red worm into the earth, so that in a few minutes, when the framework has reached the capstan, the string is withdrawn from the necklace, and you are assured that a drain has thus been invisibly formed under your feet. The jury decided as follows:—The implement went through the trial very well, laying in the tiles with great apparent ease, worked by two horses, with a capstan which was firmly and easily fixed into the ground, and afforded a firm traction to the plough by means of a wire-rope and pulley. Progress has been made, since the implement was exhibited at Exeter, in rendering the level of the drains in a degree independent of the level of the surface; but there is still room for further improvement in giving to the drain an uniform incline. The award, therefore, of the jury was honourable mention. Since that trial, I have thought it right to make further inquiry into the work of the draining plough. In the first place the trial drains were opened and laid bare from end to end. Straightness is of course one requisite, and the pipes were laid straight; closeness of contact another, and they were perfectly joined. In level, the point on which the jury doubted the perfection of the work, there was some deficiency which, on entirely flat ground such as this, was a decided fault. That fault, however, has since been remedied, for clay-land at least. As the plough was shown last year at Exeter, it could not possibly lay a level drain, because its under and upper parts being fixed at an unvarying distance, any unevenness of an undulatory surface must be faithfully copied by an undulating drain below. This year the two parts were so connected that the workman, by turning a screw, can raise or lower the underground snout which burrows out the drain. But at the trial the use of this screw depended on the workman's judgment, which cannot give the drain absolute accuracy. A balanced level, however, has now been added to the plough, by which the changes of surface are made plain to his eye. Other improvements have also been made in the implement. The horse-power required has been reduced by a fourth, and the windlass at which the horses work need now be shifted only once in the day. As to the economy of using the draining-plough, it is too expensive to purchase, unless for a large landowner."

The accounts of Mr. Pusey and of the jurors were fully borne out by the experiments here, and we were glad to hear that this wonderful machine was now beginning to be appreciated, the patentees having drained in the months of March, April, and May last, no fewer than 2,000 acres on the estates of Lord Portman, Mr. Oakley, and other gentlemen, at a cost of from 25s. to 42s. per acre without tiles. The cost of this draining under the old hands system would have been from £3 10s. to £5 10s. per acre; and we were assured by Mr. Oakley that in any case the saving was never less than £1 per acre, and in many cases much more. In clay-lands, "the invisible drain" so graphically described above by Mr. Pusey, requires no pipes, and will last for 30 years, while the interest on the cost of the pipes thus saved will amount to a sum sufficient to pay the expenses of cutting new drains every twelve years. In sandy and loose soils, however, pipes are indispensable. In ordinary soils the cost of draining by this machine is about 32s. per acre (including main drains), and the land drains eight yards apart.—*Post.*

REAPING MACHINES.

Great interest was taken in the reaping machines, of which, as we stated yesterday, no fewer than 19 were exhibited, all of which were, in a greater or less degree, modifications of the American machines of M'Cormick and Hussey. The prizes of the Royal Agricultural Society are always fixed in the preceding August, and it therefore happens that no money prize was offered for machines of this description. It was understood, however, that the society's medal would be given to the best, and the competition excited great interest, inasmuch as, by the result, the vexed question of the pre-eminence of the two machines was expected to be settled. The trial took place yesterday, and after a lengthened competition the medal was awarded to Hussey's reaping machine, exhibited by Mr. Garrett. The cutting apparatus of this implement consists of a series of knives which, by a lateral motion, obtain a cutting power similar to that of a pair of shears; while M'Cormick's machine, on the contrary, operates on the saw principle. M'Cormick's machine being designed only for American farming, is not calculated to cut the crop without leaving the stubble at the height of six or seven inches. Hussey's however (at least Garrett's specimen of it) in the trial of yesterday, left scarcely two inches of stubble; and by a peculiarity in the construction of Garrett's machines (shared, we understand, by those of Ransome and May, the two being identical in that

respect) there is no doubt by a somewhat more expensively made cutter, they might be applied with equal advantage to the mowing of grass as to the reaping of corn. Indeed, we are informed that one gentleman had cut 40 acres of grass this season with Garrett's machine. As a proof of the estimation in which these implements are already held, we may mention the fact that no fewer than 1,500 have been sold this season, and that the best manufacturers have more orders than they can execute. This sale is perfectly unprecedented in the history of agricultural machinery. We ought to mention that Mr. Crosskill, of Beverley, exhibited a reaping machine that did its work remarkably well.

The best of these reaping machines will, with two horses, clear from an acre to an acre and a-half per hour —*Ibid.*

SUSSEX STOCK.

(FROM THE SUSSEX EXPRESS.)

The breed of Sussex cattle is distinct in its character, and possesses some qualifications in a more eminent degree than any other. It is more or less spread over the whole county of Sussex and the Weald of Kent. The locality in which the Sussex are bred is in the neighbourhood of Mayfield, Rye, Pevensey, Lewes, Bramber, Petworth, and Midhurst—indeed, the whole of the land lying at the foot of the Downs from Eastbourne to Arundel; and, for the purposes to which they are applied, they are entitled to rank, as Young states, "amongst the best in the kingdom." And although the improving spirit of the age has excited considerable hostility to yoked oxen, still experience, our great teacher, has not yet satisfactorily proved that, either in point of economy or excellence, they can in all situations be superseded by horses. The trial has been made; and the horse, on the side-hill, has been compelled to yield his place to the quiet, contented ox-team. Let no stranger, therefore, who sees eight oxen drawing a waggon on a level road fancy that this is a mere absurdity; for the ox-team is not always engaged in such easy draught. Let him direct his view to the side-hills of the Downs, often nearly perpendicular, and remember that this team has to scale these heights laden with four tons of manure; and the attachments which men of high pretensions as agricultural improvers have to their ox-teams will at once be solved, and will furnish a fact which has been too inconsiderately neglected by those who have condemned the ox as an animal of draught.

The great improvement which has been effected in the breeds of the national stock commenced, probably, about the period of Bakewell. There was then a great want of distinctness of character in the Sussex breed. The black prevailed in some districts, but there were also found all the intermediate gradations of colour between that and the red. The red breed, however, was even at this period in the greatest request: the black, it is supposed, was introduced at a previous period by a cross with the Welsh. This stain on the purity of the Sussex breed it took the breeders very many years to exterminate; but by great attention and perseverance they succeeded. As the principles of breeding became better understood, and its results tested by experience, the Sussex breeders adhered strictly to the dark red character, which, at the present time, is looked upon as an evidence of thorough breed. In fact, the Michelham and May's blood, in all our modern exhibitions, has succeeded in taking the prizes. This arose from a peculiarly excellent breed of stock, of dark red colour, from the herds of the late Mr. Fuller, of May's Farm, and Mr. Child, of Michelham, which has been dispersed throughout the county, and is traceable at the present day. For the parent stock, however, whence all the best blood in the county was derived, we must go to the rich marsh land in the neighbourhood of Eastbourne. It was in that locality that Mr. Auger and Mr. Alfrey laboured so perseveringly and so successfully in the improvement of the breed, that the late Mr. Denman, of Willingdon, on one occasion gave the latter no less than 180 guineas for a bull and two cows, and thus laid the foundation of one of the best herds in the county. These, too, were the sources whence originated the famous Mays and Michelham blood, to which we have already referred—carrying all before it at our Sussex cattle shows. It would be most unjust, however, in any notice of Sussex stock, not to refer to the splendid breed for which the county is indebted to Mr. Selmes, of Knelle, near Beckley. Undoubtedly, his well-known challenge to Earl Spencer was the first step towards that national reputation, which has this year secured the Sussex breed a separate class in the premiums allotted by the Royal Agricultural Society. For this result, the county is also unquestionably indebted to Mr. Gorringe, who carried off the second prize with a Sussex animal at the Exeter meeting. It would be invidious to particularise, but we may add that in Mayfield, Ticehurst, and that district, as well as in Rolvenden, and many of the parishes in the Weald of Kent, there are breeders whose stock need fear no competition either in the county or out of it. The late John Ellman, Esq., who devoted great attention to this breed, recorded their character as follows:—"Nose tolerably wide, of a golden colour, thin between the nostril and the eye, the under jaw thin, eye rather prominent, wide across the forehead, neck neither long nor short, but clean under, with a small dewlap, the top part nearly straight to the head (not what is commonly called ewe-necked), top of the plate bones not too wide and open, sides straight, no projection at the point of the shoulder, wide and open in the breast, which should project forward; fore legs straight, rather thin, and neither long nor short; no hollowness on the back, behind the shoulder blades, which will be the case if the shoulder blades be very wide; the body as round as a barrel, chine bone straight, the ribs broad, space between the first rib and hip bones narrow, loin flat, and nearly as wide at the fore-end as the hind, each side of the loin to lie on a level with the chine and nearly parallel, which will be the case when the first rib springs well; hip bones wide between and broad, lying nearly or quite as high as the chine, the rump flat, long, and wide at the setting on of the tail, which should drop in between what is generally called the first touch, or tip of the rump; the outside of the thigh flat, and no fulness behind; the leg fine, neither long nor short; full inside the thigh, or what is called the twist. The feeding qualities are judged of from the hair being rather long and silky, and handling mellow under the skin; these generally feed well. The steers are taken into work when three years old (at which age the heifers generally produce their first calf), and are worked till six or seven years old, when they are turned off to fatten. Care should be taken that, in their work, they are kept in good condition, for if the oxen are worked till they become very low in flesh, they seldom feed well afterwards; the best breeders of cattle seldom suffer them to be much reduced.

"The average weights of oxen, when fat for market, are from 130 to 150 stone of 8lbs.; some, however, come to 180 or even 200 stone.

"The difference between the Sussex and the North Devon is not very striking; they are equally profitable to the grazier, and as working cattle they both stand unrivalled. The colour of both breeds is red, and they are supposed originally to be of the same breed. The Devon show most good breeding, but are not so large as the Sussex cattle."

The age at which the farmers usually turn off their oxen from work is at six or seven years old, although they are in some cases still longer kept to the yoke. Instances are recorded where they have been continued in the plough until they are ten years old. The late Earl of Egremont worked a pair until eleven years old, and for the previous seven years they had done as much work as any two horses. After that time they were fattened with even greater advantage than beasts of earlier age.

After spring-sowing is over it is the common practice, about May, to turn the oxen into the brook-pastures or marsh lands during the summer, in order to prepare them for stall-feeding in the winter. Those who have not accommodation for resorting to this system are in the habit of disposing of their ox-team in the fairs held at this period. At the Lewes May Fair there are generally several of these teams for sale, and formerly there were more than at present. Where the meadows are rich and the herbage luxuriant one acre will readily support one ox in a thriving state for six months, turning them out in the middle of May. It is not unusual, in the eccnomy of the Southdown farmers, to have attached to their farms a quantity of the marsh lands for fattening their sheep and oxen. In the Weald the meadows, although not so rich as those in the marshes, are still sufficiently luxuriant to enaable the farmer to graze his stock, which come to market in equal condition; showing that the excellence of stock does not depend upon any peculiar richness in the soil.

One of the good qualities in the Sussex cattle is the propensity to fatten kindly. The hide of the best sorts yields a mellowness in handling, and it possesses a firmness and sleekness which is the characteristic of good cattle, and is an infallible criterion of a healthy habit. There are still a few animals to be met with which have not been improved, and these have coarse, rough, thick hides, which are a mark of hardness of flesh, as firmness and closeness of grain convey to the feel a fine texture in the hide. The condition of the Sussex cattle is very much to be known by attendiug to this appearance in the hide, and it depends in a great measure upon the pile and growth of the coat; the shorter and sleeker the coat, the more thriving the beast; as on the contrary, in proportion to length and hardness, is its unthriftiness.

The average weights of oxen when fat for market, are from 130 to 150 stones of eight pounds; some have exceeded these weights, rising from 180 to 200 stones. One animal, which weighed 216 stones, measured as follows:—Length from crown to rump, 9 ft. 6 in.; girt before shoulders, 9ft. 5 in.; girt behind, 9 ft.; girt round the middle, 10 ft.; girt at flank, 9 ft. From nostrils to tip of tail bone, 14 ft. 8 in.; length of solid sides, 6 ft. 7 in. The Sussex beef is in higher repute in Smithfield than any other; it is beautifully marbled, finely grained, and its flavour is rich. The value of its fifth quarter renders it a great favourite with the butcher. The material object in the cattle system of Sussex is the breeding and rearing of stock for working and fattening; the dairy is but an object of secondary consideration. Upon some farms nearly as many fat oxen are annually sold as there are cows kept. In quantity of milk they are not to be compared with some other breeds, but the quality is very superior. The Sussex cows keep themselves almost beef whilst they give milk. We may instance that a cow of this breed, three weeks after weaning, gave 10lbs. of butter per week for some weeks, and the next year 9½ lbs. for several weeks, nine for several more, and then for the rest of the summer 8 to 8½lbs., and till the hard frost set in 7lbs., and during the frost 4lbs. per week. At the height of milking she gave 10lbs. of butter and 12lbs. of cheese each week, but never at any time gave more than five gallons of milk in a day.

A CATALOGUE OF IMPLEMENTS

EXHIBITED AT THE SHOW.

William Crosskill, of the Beverley Iron Works, near Beverley, York.

A patent serrated roller or clod crusher, invented, improved, and manufactured by the exhibiter (awarded the prize of £20 and silver medal at Southampton, £10 at Shrewsbury, the special award of the Council gold medal at Newcastle, and included in the award of the Council great medal at the Great Exhibition); an improved Belgian iron roller, and an improved Norwegian harrow, improved and manufactured by the exhibiter (awarded the head prize at the Royal York Meeting, and included in the award of the Council great medal at the Great Exhibition); a Ducie drag harrow, or Uley cultivator, invented by Mr. John Morton, of Whitfield, improved by Mr. Richard Clyburn, of Uley, and manufactured by the the exhibiter (awarded the head prizes of forty-five sovereigns by the Royal Agricultural Society); a "Champion" American reaping machine, invented by Obed Hussey, of Baltimore, U. S., improved and manufactured by the exhibiter; (new implements) two improved reaping machines, improved and manufactured by the exhibiter; four sets of patent cart wheels and axles, invented, improved, and manufactured by the exhibiter (awarded a medal at the Derby meeting, and a second medal, for further improvements, at the Newcastle meeting, and included in the award of the Council Great Medal at the Great Exhibition); a set of cart wheels and axles, invented by Mr. Lister, of Dunsa Bank, improved and manufactured by the exhibiter; a pair-horse improved waggon; invented, improved, and manufactured by the exhibiter (awarded the head prize of £10 at the Norwich meeting, also the head prize of £10 at the following Exeter meeting in 1851, and commended as the best waggon at the Great Exhibition); a Newcastle model one-horse plank cart and harvest cart, improved and manufactured by the exhibiter (awarded the head prize at the Newcastle meeting); a Norwich and Exeter one-horse cart and harvest cart; improved by Mr. Lister, of Dunsa Bank, and manufactured by the exhibiter (awarded the prize at the Norwich meeting, and also the prize, for further improvements by Mr. Lister, at the Exeter meeting); a "Great Exhibition" one-horse cart and harvest cart (awarded the Council great medal at the Great Exhibition, and since further improved); and an improved one-horse cart and harness cart, improved and manufactured by the exhibiter; an improved iron liquid manure cart or distributer (awarded a medal at the Cambridge meeting, since greatly improved); and an improved portable metal pump, with flexible hose pipe, &c., invented, improved, and manufactured by the exhibiter; (new implement) a patent sweeping machine, for turnpike roads, &c., invented by J. B. Blundell, of London, improved and manufactured by the exhibiter; specimens of Crosskill's portable farm railway (awarded the silver medal at Norwich); and a package of farm railway, for delivery, improved and manufactured by the exhibiter; specimen of permanent farm railway; and a two-horse power portable thrashing machine and straw shaker, invented, improved, and manufactured by the exhibiter; an improved corn-dressing machine and blower, and an improved portable four-horse thrashing machine, improved and manufactured by the exhibiter; a six-horse power improved portable patent steam engine, invented, improved, and manufactured by Messrs. Hornsby and Son, of Grantham (awarded the Council great medal at the Great Exhibition); a six-horse power fixture steam engine (awarded a prize medal at the Great Exhibition); a three-horse power patent eccentric mill (awarded the Council great medal at the Great Exhibition, since greatly improved); and (new implements) a four-horse and eight-horse power patent eccentric mills, invented, improved, and manufactured by the exhibiter; an improved horse-power driving part, improved and manufactured by the exhibiter; an Archimedean root washer, invented by Captain Carr, of Tuschenbeck, improved and manufactured by the exhibiter (awarded the silver medal at the York meeting); a patent iron fixture pig trough, invented by Wm. Torr, Esq., of Aylesbury, improved and manufactured by the exhibiter.

G. A. Pike and Co., of Framfield, near Hurst Green, Sussex.

A cultivator, grubber, and scarifier, for a rough fallow, and

for peas, oats, and wheat grattens, improved by Mr. Stone, and manufactured by Mark Bannister and Wm. Hills, of Framfield; (new implement) a pair-horse scarifier, invented and manufactured by A. Eade, of Buxted; (new implement) a turnwrest plough, improved and manufactured by the exhibiters; (new implement) a drill for small occupations, invented and manufactured by the exhibiters.

Charles Wykeham Martin, M.P., of Leeds Castle, near Maidstone, Kent.

A Mid-Kent turnwrest plough, improved by the exhibiter, and manufactured by Thomas Jenner and John Swan, of Broomfield, Lenham, Kent.

F. M'Neill and Co., Patent Felt Works, of Bunhill-row, Finsbury-square, London.

The patent asphalted felt for roofing houses and every description of farm buildings, for lining damp walls, particularly granaries, as vermin will not touch it) as a light ceiling, to be fixed underneath rafters, as, from its non-conducting qualities, it counteracts the heat of the sun, and totally excludes the frost of winter; weather-boarded roofs which have become imperfect can be made tight with a covering of this felt), improved and manufactured by the exhibiters; a portable rick-stand, of a very cheap construction, and an excellent check to vermin, invented by J. F. Williams, Patent Felt Works, Bunhill-row; models and specimen framings, illustrating various cheap constructions of roofs for the application of the felt, also showing its use for ceilings, lining damp walls, covering flats, &c.

Bernhard Samuelson (Successor to the late James Gardner), Banbury, Oxford.

Several sizes of Samuelson's patent Gardner's turnip-cutters (double action), invented by the late James Gardner, of Banbury, improved by Alexander Samuelson, of Banbury, and manufactured by the exhibiter (this implement obtained the prize medal at the Great Exhibition of 1851); a chaff-cutter, for hand-power, invented by William Riley, of Neithrop, improved and manufactured by the exhibiter; a chaff-cutter, for hand-power, improved and manufactured by the exhibiter; a universal crushing or bruising mill, invented by the late Mr. Stratton, of Bristol, improved and manufactured by the exhibiter; a bean-splitting mill, invented, improved, and manufactured by the exhibiter; an oilcake-breaker, manufactured by the exhibiter; (new implement) a M'Cormick's patent Americau reaper, invented by Cyrus Hale M'Cormick, of Chicago, and manufactured by the exhibiter (this reaper obtained the Council medal at the Great Exhibition, 1851); a registered subsoil plough, invented by William Smith, Esq., of Little Woolstone, and manufactured by the exhibiter; a five-tine horse-hoe, and a three tine horse-hoe, invented by William Busby, of Bedale, and manufactured by the exhibiter; two sizes of Anthony's patent American churn, invented by Charles Anthony, of Pittsburg, United States, and manufactured by the exhibiter (it took a silver medal at the Society's meeting at Exeter, and a prize medal at the Great Exhibition); two sizes of a registered atmospheric churn, invented and manufactured by the exhibiter; a Kase's patent force and suctiou pump, double action, invented by — Kase, of the United States, improved and manufactured by the exhibiter; a semicircular-bottomed pig-trough, manufactured by the exhibiter; three sizes of Budding's lawn-mowing machine, invented by E. Budding, of Dursley, improved and manufactured by the exhibiter; two sizes of garden rollers, manufactured by the exhibiter.

Clayton, Shuttleworth, and Co., of Lincoln.

A three-horse power, a four-horse power, a five-horse power, and a six-horse power portable steam engine, improved and manufactured by the exhibiters (this latter engine received a prize of £25 at the Royal Agricultural Society's meeting held at Norwich, 1849; £25 at Exeter, 1850; and a prize medal at the Great Exhibition of All Nations, iu 1851); a six-horse power and a four-horse power fixed steam engine, improved and manufactured by the exhibiters; a pair of registered portable Derbyshire millstones, driven by steam power (this grinding mill received the prize of £10 at the Royal Agricultural Society's meeting held at Norwich, in 1849, also at Exeter, 1850); a portable circular saw and bench; (new implement) a registered combined portable thrashing, straw-shaking, riddling, and winnowing machine, and (new implement) a set of fixed barn works, iuvented, improved, and manufactured by the exhibiters.

Rev. S. Smith, Lois Weedon, near Towcester, Northamptonshire.

A presser drill, and a rough roller and hoe implement, invented by the exhibiter, and manufactured by W. Gascoigne, of Weston-by-Weedon; a scarifier with five times, iuvented and manufactured by W. Gascoigne, of Weston-by-Weedon, Towcester.

Freeman Roe, 70, Strand, London, and at Bridgfield, Wandsworth, Surrey.

(New implement) a hydraulic ram, for raising water to supply farms, mansions, &c., invented by Montgolfier, of France, improved and manufactured by the exhibiter; (new implement) a liquid manure and fire pump, for spreading the liquid, &c., invented, improved, and manufactured by the exhibiter; (new implement) a syphon, with piston to exhaust the air, invented by Lord Camoys, of 12, Dorset-square, and manufactured by the exhibiter; a lift pump, manufactured by the exhibiter; a liquid manure pump, improved and manufactured by the exhibiter; a gutta percha suction and pipe, to convey water, &c., improved and manufactured by the Gutta Percha Company, of City-road; a water-gauge, manufactured by the exhibiter; (new implement) a wrench, invented by George Davis, of 52, Bankside, Southwark, and manufactured by the exhibiter; a four-horse portable steam engine, manufactured by the exhibiter; an hydrant, or street fire-cock, improved by the exhibiter, and manufactured by Grimes, of Rotherham; a sluice-cock for stopping liquid manure, manufactured by the exhibiter.

William Prockter Stanley, of Peterborough, Northamptonshire.

Three sizes of Stanley's registered roller mill (prizes were awarded to this mill at the Royal Agricultural Society's Show at York and Exeter—also at the following local shows, viz.: Peterborough, Huntingdon, Wisbech, Boston, Lincoln, North Stafford, North Lancashire, Northumberland, Durham, Cleveland, Brigg, Liverpool and Manchester, Prestou, Fareham, Yorkshire, &c., &c.; this machine obtained the award of a medal at the Royal Exhibition of 1851); a Stanley's oat, beau, and universal mill; a Stanley's rape and linseed cake breaker; three sizes of Stanley's registered farmer's steamiug apparatus, for cooking food for cattle, &c. (prizes were awarded to the above at the Royal Agricultural Society's Shows at York, Norwich, and Exeter; and at the following local shows, viz., Peterborough, Wisbech, Northampton, Boston, Huntingdon, North Stafford, Lincoln, Brigg, North Lancashire, Liverpool and Manchester, Northumberland, Durham, Cleveland, South Lancashire, &c., &c.); and a Stanley's improved chaff machine, with patent safety improvements, all iuvented, improved and manufactured by the exhibiter; a patent apparatus for manufacturing gas for domestic and other purposes, and for generating steam for cooking food for cattle, or for driving a small engine, invented and patented by Webster, of Leicester, improved and manufactured by G. Bower, of St. Neots, Hunts.

Thomas Glover, Thrussington, near Loughborough, Leicestershire.

A turf and stubble paring plough, invented improved, and manufactured by the exhibiter (this implement gained a prize of £4 at the Royal Agricultural Society's Show at Liverpool in 1843, a prize of £5 at the Derbyshire Agricultural Society's Show at Chatsworth in 1843, a prize of £5 at the Royal Agricultural Society's Show at Northampton in 1847, a prize of £2 and a silver medal at the Yorkshire Agricultural Society's Show at Scarborough in 1847, a prize of £5 at the Royal Agricultural Society's Show at York iu 1848, a prize of £5 at the Royal Agricultural Society's Show at Norwich in 1849, and a prize of £5 at the Royal Agricultural Society's Show at Exeter in 1850.)

Richard Hornsby and Son, Spittlegate Iron Works, near Grantham, Lincolnshire.

A six horse and a four horse power improved patent portable steam engine (this engine received the Council Medal at the Great Exhibition of the Industry of All Nations, held at the Crystal Palace, Hyde Park, London, 1851; likewise the first

prize of £50 as the best and most economical engine exhibited at the meeting of the Royal Agricultural Society of England, held at Exeter, July 1850; also the first prize of £50 at the Royal Meeting held at York, July 1848); an eight horse power horizontal fixture steam engine; a patent improved combined thrashing machine; a patent corn dressing or winnowing machine (this machine received the Council Medal at the Great Exhibition of the Industry of All Nations, held at the Crystal Palace, Hyde Park, London, 1851; also the first prize of £10 at the meeting of the Royal Agricultural Society of England, held at Exeter, July 1850; £10 at Norwich, July 1849; £10 at York, July 1848; £3 at Newcastle-upon-Tyne, July 1846); a drill machine for corn and general purposes (this drill received the first prize of £15, as the best exhibited at the meeting of the Royal Agricultural Society of England, held at Norwich, July 1849; £15 at York, July 1848; £15 at Newcastle-upon-Tyne, July 1846; £15 at Shrewsbury, July 1845; £10 at Derby, July 1813; £30 at Bristol, July 1842; and £25 at Liverpool, 1841); a patent corn and seed drill, on an improved principle (this drill received the Council Medal at the Great Exhibition of the Industry of All Nations, held at the Crystal Palace, Hyde Park, London, 1851; likewise the first prize of £10 as the best exhibited at the meeting of the Royal Agricultural Society of England, held at Exeter, July 1850; as well as a prize medal for the introduction of the patent India-rubber tubes, for conducting the seed to the ground, and for patented improvements in the fore carriage steerage); an improved patent fore carriage steerage; a patent four-row drill for turnips or mangold wurtzel seed with manure (this drill received the Royal Agricultural Society's first prize of £10 at the Exeter Meeting, 1850; £10 at Norwich, 1849; and £10 at Shrewsbury, 1845); a two-row patent ridge drill for turnips or mangold wurtzel seed, with manure (this drill received the Council Medal at the Great Exhibition, 1851; also the first prize of 10*l.* at the Exeter Meeting, 1850; the prize medal at Norwich, 1849; 10*l.* at York, 1848; 10*l.* at Shrewsbury, 1845; the prize medal at Derby, 1843; and 10*l.* at Liverpool, 1841); a patent drop drilling machine for ridges or flat ground (this drill received the Council Medal at the Great Exhibition, 1851); a drill machine for distributing pulverized manures broadcast (this drill received the first prize of 10*l.* at the York Meeting, 1848); a patent small occupation corn drill; and a four horse power portable thrashing machine, all invented, improved, and manufactured by the exhibiters; an improved patent turnip cutter, invented and improved by Messrs. Burgess and Key, of London, and manufactured by the exhibiters (received the Prize Medal at the Great Exhibition, 1851); a double cake breaking or crushing machine (received the Council Medal at the Great Exhibition, 1851; it also had the first prize at the Shrewsbury Meeting; 5*l.* at Southampton; and 5*l.* at Derby); and a single cake breaking or crushing machine, invented, improved, and manufactured by the exhibiters.

Richard Coleman, of Chelmsford, Essex.

Three sizes of the patent drag harrow, cultivator, or scarifier, invented and manufactured by the exhibiter (the prize medal was awarded to this implement at the Great Exhibition of 1851); (new implement) a patent two horse drag harrow, or scarifier, invented by the exhibiter; a patent expanding lever harrow (a prize of 5*l.* was awarded to this implement at the Newcastle Meeting, 1846); three sizes of the patent expanding harrow (the Prize Medal was awarded to this implement at the Great Exhibition of 1851); a patent subsoil harrow or pulverizer; (new implement) a one way or turnwrest plough; and (new implement) a paring and moulding plough, invented and manufactured by the exhibiter.

William Harper, of Beccles, Suffolk.

(New implement) a cultivator, invented and manufactured by the exhibiter; a chaff cutter, improved and manufactured by the exhibiter; (new implement) a horse power machinery, and (new implement) a cake crusher, invented and manufactured by the exhibiter.

Robert Holmes, of Durrington, near Worthing, Sussex.

A horse hay rake, improved and manufactured by the exhibiter.

Frederick Mason, Eagle Foundry, Ipswich, Suffolk.

(New implement) a registered English reaping machine, and (new implement) a double-winded dressing machine, invented and manufactured by the exhibiter.

Thomas Allcock, Ratcliff-on-Trent, Nottinghamshire.

A chaff-cutter with three knives, a chaff-cutter with two knives, two sets of circular wrought-iron harrows, an iron plough with two wheels, and a horse drag rake, all invented, improved, and manufactured by the exhibiter.

William Tasker and George Fowle, Waterloo Iron Works, Andover, Hampshire.

A four-horse-power portable thrashing machine, invented, improved, and manufactured by the exhibiters; a set of well machinery, for drawing water, with iron cistern and self-acting tipping apparatus (a silver medal was awarded at the Society's meeting at Southampton, 1844), and (new implement) a convex wheel roller and clod crusher, invented and manufactured by the exhibiters; a corn-dressing machine, improved and manufactured by the exhibiters; a drill machine for corn and general purposes, a Y D 3 iron two-wheel plough, a D 3 Light one-wheel plough, and an 18-inch iron field roller, invented and manufactured by the exhibiters; an improved land presser, improved and manufactured by the exhibiters; and a grinding and bruising mill (double action), invented and manufactured by the exhibiters.

Edward Hammond Bentall, of Heybridge, near Maldon, Essex.

Several sizes of Bentall's patent iron beam broadshare and subsoil plough, cultivator, or scarifier, combined in one implement (the prize of £5 was awarded to this implement at the Meeting of the Royal Agricultural Society at Exeter, in 1850, as the best pair-horse scarifier; a prize medal was awarded to it also at the Great Exhibition as a cultivator; and at the same time a prize medal was awarded to the same implement as a subsoil plough), two sizes of his patent subsoil plough, a patent light broadshare plough, three kinds of the patent mangel or ridge hoe, a patent double tom plough, an original Goldhanger plough, a patent NGH plough, a turnwrest or one-way plough, several patent parallel double-angle iron beam ploughs, a patent dynamometer (this instrument, for testing the draught of ploughs, gained a prize medal at the Great Exhibition), and a self-computing dynamometer, all invented and manufactured by the exhibiter; a hand turnip-cutter, improved and manufactured by the exhibiter; a Bentall's oilcake mill, invented and manufactured by the exhibiter; three oblong cattle water troughs, a round cattle water or feeding trough, eight round hog troughs, and two stack pillars and caps, manufactured by the exhibiter.

William C. Cambridge, of Bristol, Somersetshire.

A portable steam engine of five horse power (at the Meeting of the Royal Agricultural Society held at Bristol, in 1842, a prize of £15 was awarded; it also obtained a prize of £10 at Derby, 1843; ditto £5 at Southampton, 1844; ditto £5 at Shrewsbury, 1845; ditto £50 at Northampton, 1847), (new implement) a registered straw shaker with portable bolting thrashing machine, a portable patent four-horse power horse work, a patent portable two-horse power thrashing machine, and five sets of the patent press wheel roller and clod crusher, all invented, improved, and manufactured by the exhibiter.

Charles Barnard and John Bishop, of Norwich, Norfolk.

Three sizes of strong wrought iron garden chairs, and a strong wrought iron garden seat, invented and manufactured by the exhibiters; two wrought iron folding garden stools, with elastic galvanized wire seat, and a wrought iron folding garden chair, with elastic galvanized wire seat and back, improved and manufactured by the exhibiters; several specimens of light japanned and galvanized wire hare and rabbit proof netting, specimens of extra strong japanned wire sheep netting, also specimens of japanned sparrow proof wire netting, ten wire net plant or tree guards, and a roll of ornamental wire garden border, all invented and manufactured by the exhibiters; two wrought iron bedsteads with dovetail joints, improved and manufactured by the exhibiters; a wrought iron folding or portable bedstead, invented and manufactured by the exhibiters; a patent self-rolling mangle, invented by Charles Barnard, of Norwich, and manufactured by the exhibiters; a cottage mangle, invented and manufactured by the exhibiters; a wrought iron garden gate, manufactured by the exhibiters;

three specimens of ornamental wrought iron garden gates, an ornamental wrought iron carriage gate, and a plain wrought iron carriage gate, designed and manufactured by the exhibiters; two six bar wrought iron field gates, a seven bar strong wrought iron field gate, a three bar, a four bar, and two five bar iron hurdles, an iron hurdle, two six bar iron hurdles, a five bar portable iron hurdle, several specimens of iron hurdles for cattle and sheep, made hare and rabbit proof, with upright rods, and an ornamental wire game hurdle, all invented and manufactured by the exhibiters; a length of strained wire fencing for horses and heavy cattle, invented, improved, and manufactured by the exhibiters; two improved wrought iron staudards for strained wire fencing, an improved iron standard for atrained wire deer fencing, invented and manufactured by the exhibiters; wrought iron garden stakes, manufactured by the exhibiters; strong wrought iron garden stakes, with cast iron points, improved and manufactured by the exhibiters; two cast iron window frames and casements, invented and manufactured by the exhibiters; iron pig troughs, improved and manufactured by the exhibitera; (new implements) two Norfolk pig troughs, made of cast and wrought iron, invented and manufactured by the exhibiters; a strong wrought iron hay rack, a barrow wheel, a wrought iron sheep fold hurdle on wheels, improved and manufactured by the exhibiters; (new implement) a circular wrought iron rick stand, with cast iron pillars, and (new implement) an oblong wrought iron rick stand, with cast iron pillars, invented and manufactured by the exhibiters; and two iron rick stand pillars improved and manufac tured by the exhibiters.

James White, of 266, High Holborn.

A patent gorse reducer, invented, improved, and manufactured by the exhibiter; two steel mills for grinding wheat, and dressing the flour, in one operation (it was praised by her Majesty and Prince Albert at the Great Exhibition), a steel mill for grinding wheat by power, and a steel mill for splitting beans, improved and manufactured by the exhibiter; a steel mill for splitting beans, fixed on post; another steel mill for splitting beans, mounted on a cast-iron frame, which renders it portable, manufactured by the exhibiter; a registered roller mill, improved and manufactured by Messrs. Turner and Co., of Ipswich; (new implement) a hand chaff machine, with revolving fork, invented by E. R. Turner, of Ipswich, and manufactured by Messrs. Turner and Co., of Ipswich; a wheel chaff machine in a neat iron frame, and a chaff machine, manufactured by Richmond and Chandler, of Salford, Manchester; a small roller mill, manufactured by Messrs. Turner and Co., of Ipswich; a universal mill for grinding corn for stock feeding, and two universal mills fixed on posts, manufactured by the exhibiter; a White's roller mill for crushing corn, &c., improved and manufactured by the exhibiter; a steel mill for grinding linseed, to be fixed to a post, and a hand-power wheel, manufactured by the exhibiter; a one-horse patent gear work for turning mills, chaff-cutters, &c., invented and manufactured by Barrett, Exall, and Andrews, of Reading, and an intermediate motion, manufactured by Messrs. Turner and Co., of Ipswich.

Richmond and Chandler, of Richmond-square, Salford, near Manchester, Lancashire.

A patent sack-holder, invented by Henry Gilbert, of St. Leonard's, Sussex, improved and manufactured by the exhibiters; a patent sack-holder and barrow combined, invented by Henry Gilbert, of St. Leonard's Sussex, improved by Joshua Cooch, of Harleston, and manufactured by the exhibitera; an improved chaff-cutting machine; (new implements) four newly registered chaff cutting machines; a registered tooth roller chaff cutting machine; corn crusher, Nos. 1, 2, and 3; a grain and linseed crusher, Nos. 2 and 4; an improved root masher, and an improved steaming apparatus, all invented, improved, and manufactured by the exhibiters (the last obtained a prize of £5 at Derby, Southampton, and Shrewsbury.)

Joshua Cooch, of Harleston, near Northampton.

Two sizes of an improved patent corn-dressing machine, invented by the late John Cooch, of Harleston, improved and manufactured by the exhibiter. This machine obtained the prize of £10 at the Liverpool Meeting, July, 1841, also a prize of £15 at the Northampton Meeting, July, 1847; a barley hummeller (this obtained the prize of £3 at the Derby Meeting, 1843, also a silver medal at the Southampton Meeting, 1844, and a plough, invented, improved, and manufactured by the exhibiter; four of the patent sack-holders, invented by Henry Gilbert, of St. Leonard's-on-Sea, improved and manufactured by the exhibiter.

Thomas Bigg, of Leicester House, Great Dover-street, Southwark, Surrey.

Two sizes of the sheep-dipping apparatus, invented, improved, and manufactured by the exhibiter.

James Hayes, of Elton, near Stilton, Huntingdonshire.

Two specimens of a grinding mill, invented and manufactured by the exhibiter.

Terry and Son, of Hailsham, Sussex.

A one-way turnwrest foot plough, improved and manufactured by the exhibiters.

J. and A. Armitage, of Bury, near Ramsey, Huntingdonshire.

A brick and tile machine, invented and manufactured by the exhibiters.

Grace Cheal and Sons, of Southover, near Lewes, Sussex.

A four horse, a three horse, and a two horse power portable thrashing machine, improved and manufactured by the exhibiters; a four hand power portable thrashing machine; a corn dressing or winnowing machine, and a small occupation seed and manure drill; improved and manufactured by the exhibiters.

Thomas Beale Browne, of Hampen, Andoverford, Gloucestershire.

(New implement) a new clod crusher and pulverizer for elevating the clods and breaking them, and (new) a first-rate tarpaulin, including patent œilet-holes, all complete, invented and manufactured by the exhibiter; (new) a four-bushel sack without seam, (new) a five-bushel sack for corn or flour, and (new implement) a flax tube to convey liquids, invented by the exhibiter; (new) a coal sack, all of long hemp, without seam, sown up at the bottom by power; (new) a cheap patent cloth for all parties, made of flax and wool; flax belting for driving machinery, cheap and strong, and (new) a peculiar kind of sail cloth, applicable to many things, invented and manufactured by the exhibiter; some flax seed, grown by the exhibiter, and some flax in different stages—not picked samples.

James and Frederick Howard (sons and successors of John Howard), of Bedford.

Three patent iron ploughs, with two wheels (marked X, XX, and XXX), invented and manufactured by the exhibiters. Prizes awarded by the Royal Agricultural Society of England to Howard's patent ploughs: the first prize of £5 at the Liverpool Meeting; the first prize of £5 at the Bristol Meeting; the first prize of £10 at the Shrewsbury Meeting; a double first prize af £20 at the Newcastle Meeting; also at Northampton, 1847, at York, 1848, at Norwich, 1849, and at Exeter, 1850, the first prizes were awarded to Messrs. Howard for the best plough. At the Great Exhibition of all Nations, the prize medal was also awarded for a two-horse plough, and also the prize medal for a four-horse plough. A patent iron Kent or Sussex plough, with two wheels (marked XXX); a patent iron swing plough (marked X); a patent iron plough, with two wheels, (marked JA) No. 1—this is the original "Champion" plough of Messrs. Howards', which gained nine first premiums at the annual meetings of the Royal Agricultural Society; a patent iron plough, with two wheels (marked JD) No. 1; a patent iron turnwrest plough, with two wheels; an improved Northumberland ridge, or double-breast plough (marked DB), and a new patent subsoil plough, or sub-pulverizer, all invented and manufactured by the exhibiters; a Read's patent iron subsoil plough or sub-pulveriver, invented by the late John Read of Loudon, improved and manufactured by the exhibiters (the Royal Agricultural Society has awarded the following premiums to this implement: the first prize of £10 at the Southampton Meeting, in 1844; the first prize of £10 at the Shrewsbury Meeting, 1845; the first prize of £10 at the Newcastle on-Tyne Meeting, in 1846; the first prize of £10 at Northampton, 1847; and the first prize of £5 at the

Exeter Meeting, 1850, was awarded to the exhibiters for their improvements in this plough); sets of patent four-beam harrows, with whippletrees, marked Nos. 12 and 14 (the Royal Agricultural Society of England has awarded to the exhibiters the following premiums for harrows: Derby Meeting, 1844, first prize of 5*l.*; York Meeting, 1848, first prize of 5*l.*; and the first prize at Exeter, 1850); a set of patent three-beam harrows, with whippletree (marked No. 11); sets of new patent jointed harrows, with whippletrees, marked Nos. 10, 12, 13, and 15 (the prize for the best set of harrows was awarded by the Royal Agricultural Society of England to a similar set at the York Meeting, 1848; also at Exeter, 1850); and a set of patent iron drag harrows, with whippletree (marked No. 17), all invented by William Armstrong and James Howard, of Bedford, and manufactured by the exhibiters; an improved wrought-iron scarifier, or cultivator (with 9 coulters), improved and manufactured by the exhibiters; a set of improved trussed whippletrees, invented by Egerton Harding, Esq., of Old Springs, improved and manufactured by the exhibiters; a set of improved equalizing whippletrees, and a set of improved steelyard whippletrees, improved and manufactured by the exhibiters; an improved iron horse hoe, invented and manufactured by the exhibiters; an improved iron horse hoe, improved and manufactured by the exhibiters; a patent horse drag rake, invented and manufactured by the exhibiters (the Royal Agricultural Society awarded the prize to this implement at Exeter, 1850; at the Great Exhibition of All Nations, the exhibiters gained the prize medal for their patent horse rake); an improved Bedfordshire one-horse cart; specimens of new patent ploughshares, manufactured by the exhibiters, and sundry models of implements.

James Howard, of Bedford, and Geo. Stacey, of Uxbridge.

An improved patent "British" reaping and mowing machine, invented by the exhibiters, and manufactured by George Stacey, of Uxbridge; and an improved patent "British" reaping and mowing machine, invented by the exhibiters, and manufactured by J. and F. Howard, of Bedford.

Richard Read, No. 35, Regent Circus, Piccadilly, London, Middlesex.

A patent subsoil pulverizer, invented by the late John Read, and manufactured by the exhibiter (a prize of £10 was awarded for this implement at Southampton in 1814, Shrewsbury 1845, Newcastle-on-Tyne 1846, and Northampton 1847); a patent double action agricultural fire engine, complete, invented by the late John Read, and manufactured by the exhibiter; a patent agricultural fire engine, smaller (a silver medal was awarded for this engine at Exeter, July, 1850), and a patent watering engine, invented, improved, and manufactured by the exhibiter; a patent injecting instrument and tube, complete for horses, cattle, &c., and a hollow probang, for relieving hoven or choked cattle, invented by the late John Read, improved and manufactured by the exhibiter; a hollow probang for relieving hoven sheep, calves, &c., invented and manufactured by the exhibiter; two patent hand watering machines, invented, improved, and manufactured by the exhibiter; a double action greenhouse pump, invented and manufactured by Samuel Nye, of Newington Butts; and a horticultural tobacco fumigator, invented by Captain Brown.

William Newzam Nicholson, Newark-on-Trent, Nottinghamshire.

Three machines for breaking oilcake for beasts and sheep (had a prize of £5 awarded at the Norwich Show), and two machines for breaking oilcake for beasts and sheep, and rape-cake for tillage (received the prize of £5 at the Exeter Show, and the prize medal at the Great Exhibition, London), invented, improved, and manufactured by the exhibiter; a machine for grinding beans, oats, malt, barley, &c., and a winnowing or corn dressing machine, improved and manufactured by the exhibiter; (new implement) a corn roughing or winnowing machine, and (new implement) a winnowing or corn dressing machine, which may also be used as a blower, invented, improved, and manufactured by the exhibiter; a barley awning or hummelling machine, improved and manufactured by the exhibiter; two cottage cooking ranges, with patent improvements (had a prize of £5 awarded at the York Show, and a further prize of £5 at the Exeter Show), a cooking range, adapted for a small farm kitchen or bailiff's cottage, a cooking range for farm kitchens, a superior range for farm kitchens, two cottage cooking grates, two Anglo-German cooking stoves for cottages (had a silver madal awarded at the Exeter Show), a cottage grate for bedrooms, a cosmopolitan cooking stove, a cottage pump and sink, with drain trap, &c., and a chaff engine, all invented, improved, and manufactured by the exhibiter.

James Comins, South Molton, Devon.

A plough for general purposes, a paring plough, two registered one-way turnover or turnwrest ploughs, and a horse hoe on the flat, invented, improved, and manufactured by the exhibiter; (new implement) a pair horse scarifier, invented and manufactured by the exhibiter; a cultivator, grubber, or scarifier, two subsoil pulverizers, two small horse hoes, and a horse hoe, invented, improved, and manufactured by the exhibiter; a horse hoe, invented and manufactured by the exhibiter (awarded the prize medal at the Great Exhibition); a set of heavy harrows, a pair of light harrows, and a filling-in plough, invented, improved, and manufactured by the exhibiter; two sets of pair-horse whippletrees, manufactured by the exhibiter.

George Cottam and Samuel Hallen, 2, Winsley-street, Oxford-street, London.

A sample of stable brackets for hanging saddles on, a sample of bridle hooks, rack chains, halter chains, pillar chains with spring hooks, a galvanized dog trough, a stable bucket, a stable sash or bull-eye light, and a sack holder, manufactured by the exhibiters; a stable fork, manufactured by Messrs. Lyndon and Co., of Birmingham; a sack truck, a skid pan and drag chain, a stable lanthorn with plate glass, another stable lanthorn, a stable pump, and a length of suction pipe six feet long, all manufactured by the exhibiters; a length of stable gutter six feet long, an angle piece of the above, a T-piece of the above, a stable grate and frame, a horse pot, and a mare pot, all manufactured by the exhibiters; an improved horse pot, improved by Mr. Cottam, and manufactured by the exhibiters; two carriage setters, a registered manger rack and water trough, a manger and wrought-iron rack, and a double improved corner manger, invented by G. Cottam, and manufactured by the exhibiters; two cast iron mangers, iron work for the partition of a stall, two wrought-iron corner hay racks, a sample of cottage sashes with ventilators, a set of hand glass frames, and a cast-iron enamelled washhand basin, manufactured by the exhibiters; an odometer or land measure, and a dynamometer or draught gauge, invented by George Cottam, of 2, Winsley-street, and manufactured by the exhibiters; a set of draining tools and a rick stand, manufactured by the exhibiters; two sizes of serrated chain harrow, invented by James Smith, of Deanston, improved by George Cottam, of 2, Winsley-street, and manufactured by the exhibiters; three sizes of the mowing machine, invented by Mr. Budding; and a reaping machine, invented by Mr. Hussey; two wheat mills and dressing machines, and two sizes of liquid manure pumps, invented by George Cottam, of 2, Winsley-street, and manufactured by the exhibiters; an assortment of metallic churns, invented by Mr. Johnson, of London, and manufactured by the exhibiters; a turnip cutter, an oat bruising machine, a chaff machine, a saw table and boring machine, and a saw table, invented by George Cottam, of 2, Winsley-street, and manufactured by the exhibiters; a skim or paring plough, manufactured by the exhibiters; a scarifier or grubber, invented by Mr. Coleman; a Norwegian harrow, invented by Mr. G. E. Frere, F.R.S, of Roydon, and manufactured by Messrs. Stratton, of Bristol; a winnowing machine, invented by Samuel Wheatley, of Radcliff, and manufactured by the exhibiters (awarded a prize of £10 at the Shrewsbury Show, July, 1845); two samples of strained wire fence, two samples of sheep hurdles, a sample of light cattle hurdles, and a sample of strong cattle hurdles, manufactured by the exhibiters.

J. Gray and Co., Uddington, near Glasgow, Lanark, N. B.

Two sizes of an improved Scotch one-horse farm cart, improved and manufactured by the exhibiters (awarded the prize medal at the Great Exhibition of 1851); a parallel lever subsoil pulverizer (commended at the Exeter Meeting), an improved subsoil pulverizer, a strong deepsoil plough, for three or four horses, two sizes of an improved two-horse Scotch

swing plough, and a parallel five-tined drill grubber or pulverizer, invented and manufactured by the exhibiters; a parallel expansion horse-hoe for drill crops, a light drill scuffle or horse hoe, and a light drill scuffle or horse hoe, improved and manufactured by the exhibiters; an improved equalizing three-horse yoke for working abreast and two two-horse yokes.

Mapplebeck and Lowe, of Birmingham, Warwickshire.

Several sizes of a platform weighing machine, of improved construction, invented and manufactured by W. and T. Avery, of Birmingham; a set of new pattern iron weights, a portable kibbling mill on a frame, a portable bean splitting mill on a frame; and a portable malt mill, on a frame, manufactured by the exhibiters; three sizes of the two-knife chaff-cutter, invented and manufactured by J. Cornes, of Barbridge; a two-knife chaff-cutter, a turnip-slice, and an iron field roller 18 inches diameter, manufactured by the exhibiters; (new implement) a chain harrow, invented and manufactured by W. Vaughan, of Oxley; and a double mouldboard plough, manufactured by W. Vaughan, of Oxley; (new implement) an expanding cultivator or scarifier, invented and manufactured by W. Simpson, of Birmingham; an iron hurdle (the "Glasgow" pattern), two other iron hurdles, an improved sheep folding hurdle, manufactured by the exhibiters; several rolls of wire hare and rabbit netting, and a roll of poultry netting, manufactured by the exhibiters; two sets of bright draining tools, invented by Josiah Parkes, Esq., of London, and manufactured by W. A. Lyndon, of Birmingham (the prize of £5 was awarded to the exhibiters for these tools at the Northampton meeting of the Royal Agricultural Society, 1847); three sets of draining tools, and a set of bright draining tools for clay land, manufactured by W. A. Lyndon, of Birmingham; two sets of bright draining tools for clay land, manufactured by the exhibiters (these tools obtained the prize of £3 at the Norwich meeting of the Royal Agricultural Society, 1849, and the prize of £3 at the Exeter meeting of the Royal Agricultural Society, 1850); two sets of steel American digging forks, a three-prong steel manure fork, and a four-prong steel manure fork, a three-prong steel manure fork with long handle; a diamond-shaped three-prong steel manure fork, a diamond-shaped four-pronged steel manure fork, a round three-prong steel manure fork, a round four-prong steel manure fork, a cast-steel potato fork, a cast-steel "Minerva" digging fork, a cast-steel "Yellowley" digging fork; and a cast-steel "Sillett's" digging fork, improved and manufactured by W. A. Lyndon, of Birmingham; a set of farm labourers' tools, a set of cottager's allotment tools, and a set of hoes, manufactured by Hunt and Co., of Birmingham; a bundle of No. 4 fencing wire, manufactured by the exhibiters; a Budding lawn mowing machine, with registered improvements, invented by E. Budding, of Dursley, improved and manufactured by Ferrabee and Sons, of Stroud; a cattle tube and mouth piece, and a sheep tube and mouth piece, invented by Dr. Monro, of Birmingham, manufactured by Jones and Co., of Birmingham; a set of sickles, reaping hooks, &c, manufactured by R. Butterley, of Sheffield; and a stand of models.

Joseph Marychurch, Haverfordwest, Pembrokeshire.

A small occupation nine-row corn- drill, and a fore carriage steerage, manufactured by the exhibiter; an improved lever horse drag rake, improved and manufactured by the exhibiter; an iron plough, and (new implement) a patent American cheese press, manufactured by the exhibiter; an aëriel barrel churn, improved and manufactured by the exhibiter; a turnip cutter, invented by Charles Phillips, of Bristol, and manufactured by the exhibiter; a turnip cutter, invented partly by Chas. Phillips, of Bristol, and partly by the late James Gardner, of Banbury, manufactured by the exhibiter; a double-action turnip cutter, invented by Jas. Gardner, of Banbury, improved by Charles Phillips, of Bristol, and manufactured by the exhibiter; a turnip cutter, invented by James Gardner, of Banbury; manufactured by the exhibiter; (new implement) a patent grate for cutting the last piece of turnip, shewn in a turnip cutter, invented by Charles Phillips, of Bristol, manufactured by the exhibiter.

James Smyth and Sons, Peasenhall, near Yoxford, Suffolk, and Witham, Essex.

A patent one-row, a three-row (this drill was awarded a prize of £10, and a silver medal, at Southampton, in 1844), and a five-row turnip and mangold wurzel seed and manure drill; a patent three-row, and five-row turnip and mangold wurzel seed drill; a patent manure drill; (for this drill a prize of £10 was awarded at the Royal Agricultural Society of England's meeting, at Liverpool, in 1841); a patent seven-row corn drill; a patent ten-row corn drill; a patent eleven-coulter corn drill; (a prize of £5 was awarded for this drill at the Royal Agricultural Society's meeting at Derby, 1843); a patent twelve-row corn drill; a patent thirteen-row corn and seed drill; a patent fourteen-coulter corn and clover seed drill; a patent fifteen-coulter corn drill; a patent thirteen and two-coulter corn drill; and a patent broad-cast manure distributor; all invented, improved, and manufactured by the exhibiters.

William Ball, of Rothwell, near Kettering, Northamptonshire.

An iron plough; invented by the exhibiter. A prize of £5 was awarded to this plough for general purposes, at the Royal Agricultural Society's meeting at Norwich, 1849; and a prize of £7, at Exeter, 1850; and also a prize medal at the Great Exhibition of All Nations, 1851. Five iron ploughs; an iron subsoil pulverizer; a light waggon for two horses; a one-horse cart, for general purposes; a pair horse scarifier; and light iron harrows; all invented, improved, and manufactured by the exhibiter; and a set of whipple-trees for plough.

Henry Bennett, of 34, London Road, Liverpool, Lancashire.

An improved chaff machine, No. 10; (new implement) a strong and improved gorse and chaff cutting machine, No. 1; (new implement) a smaller gorse and chaff cutting machine, No. 3; an improved bean and oat mill, No. 7; an improved mill for crushing oats, malt, and linseed, No. 8; and an improved mill for kibbling beans, Indian corn, peas, oats, &c., No. 9—all invented by Cartmell, of Doncaster; improved and manufactured by the exhibiter. (New implement) a small post mill for kibbling beans, Indian corn, peas, oats, malt, &c., No. 5, invented, improved, and manufactured by the exhibiter; a stroug steel mill for grinding flour, No. 3, improved and manufactured by the exhibiter; (new implement) a three horse power bone mill, No. 4, and (new implement) a bone mill for two men, No. 1, invented and manufactured by the exhibiter; a strong three-knife double-action turnip slicer for sheep and cattle, No. 1, and (new implement) a smaller double-action turnip &c. cutter, for sheep and cattle, No. 3, invented by Jno. Cartmell, of Liverpool, improved and manufactured by the exhibiter; a small single-action turnip &c. slicer, for cattle only, No. 4, improved and manufactured by the exhibiter; (new implement) a steaming apparatus for cattle, No. 4½, invented, improved, and manufactured by the exhibiter; new implement) strong clod-crushing and general roller, No. 10, invented by Dr. Z. Sillar, of Rainford Hall, improved and manufactured by the exhibiter; a strong circular pig trough, No. 5, manufactured by the exhibiter, a strong manure pump and a strong sack-truck, improved and manufactured by the exhibiter; a new mill for crushing sugar and grinding chicory and cocoa, invented by Cartmell, of Liverpool, improved and manufactured by the exhibiter; and a box containing three samples of pure ground bones ground by the new mill, No. 4, ground by the exhibiter.

Thomas Attwood, Lewes, Sussex.

Four different sizes of the Sussex metallic churn and pan, improved and manufactured by the exhibiter; four specimens of the horse singeing apparatus, invented and manufactured by the exhibiter; an iron stable pail, a galvanized iron stable pail, an improved galvanized iron pail, and a galvanized iron garden wheelbarrow, manufactured by the exhibiter; (new implement) a high narrow-top galvanized iron corn bushel measure, a high galvanized iron half-bushel corn measure, and a broad-top galvanized iron corn bushel, invented and manufactured by the exhibiter.

Gibson and Richardson, Newcastle-upon-Tyne, Northumberland.

(New implement) a "Northumberland" clod-crusher, invented by Matthew Gibson, of Newcastle-upon-Tyne, and manufactured by the exhibiters (this implement gained the prize medal at the Great Exhibition, No. 43 in the prize-sheet).

WILLIAM DRAY and Co., of Swan-lane, London.

Two circular pig troughs, an enamelled manger, an enamelled corner manger, a galvanized iron stable pail, several wrought-iron painted pails, three plate-glass safety stable lanterns, three garden stools, and four rustic chairs, all invented and manufactured by the exhibiters; (new implement) a hand-hoe, invented and manufactured by George Walker, of Barningham, Richmond, Yorkshire; three chaff-engines, two corn-crushers, and an improved linseed mill, No. 2, invented by Richmond and Chandler, of Salford; (new implements) two registered prize winnowing machines, and (new implement) a registered machine for riddling, blowing, and seed-separating, invented by J. Cornes, jun., and manufactured by the exhibiters; two (new implements) registered chaff and litter cutters, with two knives, for steam or other power, and (new implement) a horse drag rake, invented and manufactured by the exhibiters; a Corne's registered plough, (new implement) a scarifier and cultivator for two horses, a horse-hoe with three cutters, a perpendicular stroke double-action balance churn, and a perpendicular stroke single-action balance churn, invented by J. Cornes, jun., and manufactured by the exhibiters; a compound lever cheese press, (new implement) a mangle for public use, and a mangle for private families, invented and manufactured by the exhibiters; (new implement) a disc thrashing machine, or barn-work, invented by J. Cornes, jun., and manufactured by the exhibiters; a mill for grinding and kibbling all kinds of grain, invented and manufactured by the exhibiters; (new implement) five sizes of Dalphin's patent churn, invented by J. Dalphin, of America, and manufactured by the exhibiters; an iron wheelbarrow, a wrought-iron liquid manure pump, a weighing machine, (new implement) the Kentish champion plough, and (new implement) an iron turnwrest plough, invented and manufactured by the exhibiters; a cart and cattle machine, to weigh from 1lb. to 3 tons, a five-sack and a three-sack weighing machine, a 22 inch dormant Fairbank's weighing machine, a steelyard with bushel measure, and an improved bean and oatbruiser, invented and manufactured by R. Forshaw and Co., of Liverpool; a patent drying machine, invented and manufactured by Manlove, Allcott, and Co., of Lenton Works, near Nottingham; three Boyd's patent double-action or self-adjusting scythes, invented by J. Boyd, of Thames-street, London, and manufactured by the exhibiters; a flax seeding machine, and a flax seed and corn-dressing machine, invented and manufactured by R. Robinson, of Belfast; an enamelled cast-iron manger and water trough, with rack, invented and manufactured by Cottam and Hallen, of London; a portable forge, and a portable engine for farm or garden purposes, invented and manufactured by the exhibiters; (new implement) a model of Cornes's patent disc thrashing machine; a Budding's patent lawn mowing machine, invented by Budding, and manufactured by the exhibiters; (new implement) a grindstone with treadle, and (new implement) a washing machine on cradle, invented and manufactured by the exhibiters; two Sussex churns, manufactured by the exhibiters; (new implement) an engine adapted for hop-grounds, and a farm fire-engine, with tank, invented and manufactured by the exhibiters; (new implement) a horse-barrow, for levelling uneven ground, &c., &c.; iron circular tables for lawns, and other iron tables, invented and manufactured by the exhibiters; iron hurdles, and galvanized wire netting for fencing, manufactured by the exhibiters; a sack-barrow, a wrought-iron wheelbarrow, and two garden seats, invented and manufactured by the exhibiters; a tile-machine, invented and manufactured by W. Williams, of Bedford; a hay-rack (front), and a hay-rack (corner), manufactured by the exhibiters; (new implement) a liquid manure cart, invented and manufactured by the exhibiters, and (new implement) an American reaper, invented, improved, and manufactured by Obed Hussey, of Baltimore, U. S.

HENRY KEARSLEY, of Ripon, Yorkshire.

(New implement) an iron tile machine, invented and manufactured by the exhibiter (this machine gained a prize of a silver medal, in 1851, at Burlington Show, and the Liverpool and Manchester Agricultural Society awarded £5 and a silver medal; also a prize of £2 was awarded to it at the Wetherby Show); (new implement) a Ducie's drag and scarifier (wrought-iron), invented by Ducie, improved and manufactured by the exhibiter (this implement gained a prize of £3 at Burlington, 1851; the Liverpool and Manchester Society awarded a prize of £5 and a silver medal; it also gained a prize at Wetherby, 1851); (new implement) a Norwegian harrow (the Meeting of the Yorkshire Agricultural Society, held at Thirsk in 1850, awarded a prize to the above; the Liverpool and Manchester Society awarded it a prize of £1, and the Wetherby Show, 1851, a prize of £2, as the best implement shown); (new implement) a press for bricks and pantiles, (new implement) a horse-rake, and (new implement) a wrought-iron horse-hoe, for turnips, potatoes, or beans, invented and manufactured by the exhibiter.

THOMAS SCRAGG, of Calveley, near Tarporley, Cheshire.

A single-action machine for making draining pipes and tiles, invented, improved, and manufactured by the exhibiter, and a single-action tile machine.

WILLIAM BUSBY, of Newton, Bedale, Yorkshire.

Two one-horse carts, invented by W. Lister, Esq., of Dunse Bank, Yorkshire, improved and manufactured by the exhibiter (the prize of £10 was awarded to this cart at the Exeter Meeting in 1850; it was also included in the awards of the Council medals of the Great Exhibition 1851), and a one or two-horse cart, invented by the same person; an improved market cart, invented by Mr. T. Scott, of Ripon, and manufactured by the exhibiter; a two-wheeled deep plough (this plough received the prize of £10 at the Society's Meeting at Northampton in 1847, £10 at York in 1848, and was included in the Council medals of the Great Exhibition 1851), and a two-wheeled plough for general purposes, invented, improved, and manufactured by the exhibiter (this plough received the award of the Council's medal at the Great Exhibition 1851); two two-wheeled ploughs, invented by the exhibiter; a plough with one wheel, a swing plough, a Norwegian harrow, a two-horse scarifier and cultivator, a turnip-slicer, three horse hoes, a horse-hoe with screw to alter the tines to any declivity while at work, a horse-hoe on the ridge, a horse-hoe with five tines, a light horse-hoe, a subsoil plough, invented and improved by the exhibiter, and a horse-rake.

JAMES CORNES, of Barbridge, Nantwich, Chester.

A registered chaff-cutting machine, with three knives, and one with two knives, invented by John Cornes, of Barbridge, improved and manufactured by the exhibiter (this machine gained a prize of £10 at the Royal Agricultural Society's Meeting at Shrewsbury, in 1845; at Newcastle-upon-Tyne, in 1846; at Northampton, in 1847; the Society's silver medal at York, in 1848; £10 at Norwich, in 1849; £10 at Exeter, in 1850; and the prize medal of the Great Exhibition in 1851); five other chaff-cutting machines, invented by John Cornes, of Barbridge, improved and manufactured by the exhibiter; and a curd mill, invented and manufactured by the exhibiter.

WILLIAM CROWLEY and SONS, of Newport Pagnell, Buckinghamshire.

A light one-horse cart for general purposes, a set of Newport hames for general purposes, a horse-hoe for one row on the ridge and on the flat, a horse-hoe with steerage for 5 or 7 rows, invented, improved, and manufactured by the exhibiters; and a box containing models of cart and hoe.

CHARLES HART, of Wantage, Berkshire.

The barn-work of a thrashing machine, driven by steam power, a four-horse power portable thrashing machine, a two-horse power portable thrashing machine, a two-horse scarifier and skim plough, a five-tined registered scarifier and skim plough, a seven-tined registered scarifier and skim plough, and a liquid manure water-cart, all invented and manufactured by the exhibiter.

WM. SMITH, Kettering, Northamptonshire.

(New Implement) an improved double blasted winnowing machine, invented by Nathaniel Smith, of Kettering, improved and manufactured by the exhibiter; (new implement) a steerage horse hoe, with double bar, and (new implement) an improved steerage horse hoe, with single bar, invented, improved, and manufactured by the exhibiter.

ALFRED SPARKE, of Norwich, Norfolk.

A portable five horse power steam engine, manufactured by

Sparke and Co., of Norwich; and a portable thrashing machine, with shaker and colder riddle, invented and manufactured by Sparke and Co.

Thomas Davis, of Battle, Sussex.

(New implement) a plough for general purposes, improved and manufactured by the exhibiter.

Richard Garrett and Son, of Leiston Works, near Saxmundham, Suffolk.

A drill for general purposes (prizes were awarded to this drill at Liverpool, 1841, £10; at Derby, 1843, £30; at Southampton, 1844, £20 and a medal; at Northampton, 1847, £15; at Exeter, 1850, £10; and at the Great Exhibition of 1851, included in the award of the Council Medal); a drill for turnips and manure on the flat (prizes were awarded for this drill at Cambridge, 1840, £10; at Northampton, 1847, £10; at York, 1848, £10; and at the Great Exhibition 1851 included in the award of the Council Medal); a drill for turnips and mangold-wurtzel with manure on the ridge, improved and manufactured by the exhibiters (prizes were awarded for this drill at Bristol, 1842, £20; at Northampton, 1847, £10; at Norwich, 1849, 10*l.*); a patent drop drill for turnips and other seeds with manure on the flat or ridge (prizes were awarded for this drill at Norwich, 1849, 10*l.*; and at Exeter, 1850, 10*l.*); and (new implement) a three-row economical drill for turnips, &c., with manure on the flat or ridge, invented and manufactured by the exhibiters; a broadcast manure distributor, invented by H. E. Blythe, Esq., of Burnham, Norfolk, and manufactured by the exhibiters; a 15-row lever corn drill, a 12-row lever corn and seed drill, and a 10-row lever corn and seed drill (a prize was awarded for this drill at Norwich, 1849, 10*l.*), all improved and manufactured by the exhibiters; a 9-row lever corn and seed drill (a prize of 10*l.* was awarded at the Exeter meeting in 1850 for this drill), a hand lever seed drill (a prize of 3*l.* was awarded for this drill at the Exeter meeting, 1850), and a hand-barrow seed drill (this seed drill was included in the award of the Council Medal at the Great Exhibition of 1851), all invented and manufactured by the exhibiters; a Garrett's patent horse hoe, No. 5 and No. 9, invented, improved, and manufactured by the exhibiters (prizes were awarded for this implement at Liverpool, 1841, 5*l.*; at Bristol, 1842, 10*l.*; at Derby, 1843, a medal; at Southampton, 1844, a medal; at Northampton, 1847, a medal; at York, 1848, a medal; at Norwich, 1849, 10; at Exter, 1850, 10*l.*; at the Great Exhibition 1851 a Council Medal); a two-horse-power portable thrashing mechine, and a four-horse-power open-drum thrashing machine, invented and manufactured by the exhibiters; a four-horse-power bolting thrashing machine barn work (prizes were awarded for this machine at Newcastle, 1846, 25*l.*; at Northampton, 1847, 20*l.*; and at York, 1848, 20*l.*), a fixed thrashing machine, fixed with straw shaker, screen, and winnowing apparatus for steam power (prizes were awarded for this machine at Norwich, 1849, 25*l.*, and at the Great Exhibition, in 1851, included in the award of the Council Medal), and a portable thrashing machine, fitted with straw shaker and screen for steam power (prizes were awarded for this machine at Norwich, in 1849, 25*l.*, and the Great Exhibition, in 1851, included in the award of the Council Medal), all invented, improved, and manufactured by the exhibiters; a portable steam engine (prizes were awarded to this engine at Norwich, 1849, and at the Great Exhibition 1851 included in the award of the Council Medal), a five-horse power portable steam-engine, a seven-horse power fixed steam engine, and a portable stone mill, all improved and manufactured by the exhibiters; a corn dressing machine, invented and manufactured by the exhibiters; a corn dressing machine, a linseed, malt, oat, and bean mill, a chaff cutter for horse or steam power, a chaff cutter for horse or hand power, a chaff cutter for hand power, and a rape and linseedcake crusher, all improved and manufactured by the exhibiters; a double action turnip cutter, invented by the late James Gardner, of Banbury, manufactured by the exhibiters; (new implement) an American reaping machine, invented by Obed Hussey, of Baltimore, U. S., America, improved and manufactured by the exhibiters; (new implement) registered skim cultivator, invented by Rev. E. H. Johnson, of Gravelye, Linfield, Sussex, manufactured by the exhibiters; a patent drag harrow and scarifier, invented by Richard Coleman, of Chelmsford, and manufactured by the exhibiters; a double-action hay-making machine, and a patent lever drag rake, improved and manufactured by the exhibiters; a wrought-iron corn rick stand, invented by the late J. Springhall, of Ipswich, and manufactured by the exhibiters (a medal was awarded for this rick stand at the Southampton meeting); a patent drain pipe and tile machine, invented by Rich. Weller, of Capel, Dorking, Surrey, and manufactured by the exhibiters (a prize of 5*l.* was awarded for this machine at Newcastle, in 1846.)

Smith and Ashby, of Stamford, Lincolnshire.

A patent improved double-action haymaker, on patent wrought-iron wheels, invented, improved, and manufactured by the exhibiters (obtained a prize of 5*l.* at the Royal Agricultural Society's Meeting at Newcastle in 1846, 5*l.* 5s. at the Great Yorkshire Meetiug in 1846, 5*l.* 5s. at the Derbyshire Meeting in 1846, at the Great Yorkshire Meeting in 1847, the Royal Agricultural Society's medal at York in 1848, at the Great Yorkshire Meeting in 1849, 5*l.* at the Royal Agricultural Society's Meeting at Norwich in 1849, 5*l.* at the Royal Agricultural Society's Meeting at Exeter in 1850, the prize at the Great Yorkshire Meeting in 1850, and the prize medal of the Great Exhibition of 1851); (new implement) a patent improved two-horse double-action haymaker, an improved patent horse rake (all iron) for hay, corn, stubble, twitch, and light scarifying purposes; a patent lever wheel hand rake for hay, corn, stubble, twitch, &c.; an improved prize cultivator, grubber, or scarifier (No. 2), of wrought-iron (awarded the medal of the R. A. S., at Newcastle, in 1846, and the prize of 10*l.* at Norwich in 1849, 5*l.* 5s. at the Great Yorkshire Meeting in 1849, 10*l.* at the Royal Agricultural Society's Meeting at Exeter in 1850, the Great Yorkshire prize of 5*l.* in 1850, and the prize of the Royal North Lancashire Show in 1850); an improved prize patent safety chaff and litter cutter, No. 1 (awarded the prize medal of the Great Exhibition of 1851); a patent safety portable chaff and litter cutter, a No. 3 3-knife patent safety chaff-cutting machine, a No. 4 3-knife patent safety chaff-cutting machine (highly commended by the judges of the Royal Agricultural Society at Exeter in 1850), a No. 4 3-knife patent safety chaff-cutting machine, a No. 5 2-knife patent safety chaff-cutting machine, a patent park or luggage cart, on springs, for pony or small horse; a newly-invented one-horse cart, for harvest work and general purposes; and an improved one and two-horse cart, with patent improvements; all the above were invented, improved, and manufactured by the exhibiters; and a sample of Smith and Ashby's patent wrought-iron wheels and axles, invented and manufactured by the exhibiters.

Tuxford and Sons, of Boston and Skirbeck Iron Works, near Boston, Lincolnshire.

A six-horse power and two four-horse power patent portable housed steam engines (these engines are on the same principle as the one to which the prize medal was awarded at the Society's Meeting in connection with the Great Exhibition of 1851), a six-horse power fixed steam engine for agricultural purposes, a fixed steam engine for agricultural purposes, two patent combined thrashing, shaking, and blowing machines, a patent perforated table straw shaker, a mill for grinding meal for agricultural purposes, and a saw table for agricultural purposes; all the articles on this stand were invented, improved, and manufactured by the exhibiters.

John Smith, of Uxbridge, Middlesex.

A four horse thrashing machine with shaker and riddle, a three horse thrashing machine with horse works, a four horse works complete on wheels, and a double oat and bean mill for power, improved and manufactured by the exhibiter; a double oat and bean mill for hand power, a bean crusher, an oat bruiser, an oilcake mill, and a one-horse power gear work, manufactured by the exhibiter; (new implement) a patent digging machiue, invented and improved by Martin J. Roberts, Esq., of Gerrard's Cross, and manufactured by the exhibiter; a wrought iron skim plough with patent movement, a Lomax patent chaff cutter, and a Lomax chaff cutter, No. 3, for power, invented by William Lomax, of Uxbridge, and manufactured by the exhibiter; a barley hummeller, improved and manufactured by the exhibiter; a cylindrical cinder sifter on wheels, invented by A. K. Smith, of Exminster, and manufactured by the exhibiter; a one-horse hoe, a skim plough with wood frame, a winnowing machine, a blower, and a strong wooden wheelbarrow, manufactured by the exhibiter; a straw shaker for thrashing machine, invented by William Lomax, of Uxbridge, and manufactured by the exhibiter.

Wm. Hensman and Son, of Castle Works, near Woburn, Beds.

A patent eight-row cup and steerage corn and turnip drill, with self-acting hopper (awarded a silver medal at the York Meeting in 1848, and a prize medal was also awarded to it at the Great Exhibition of 1851), a patent six-row cup and steerage drill for small occupations, a turnip drill and horse-hoe on the flat, combined; a plough for general purposes, and a plough for deep ploughing (awarded the prize medal at the Great Exhibition of 1851), invented, improved, and manufactured by the exhibiters; a horse-hoe on the ridge, improved by G. W. Baker, of Woburn, and manufactured by the exhibiters; a patent vandyke hand thrashing machine, and an improved land presser with drill and hoes attached, improved and manufactured by the exhibiters; a turnip drill on the ridge, improved by G. W. Baker, of Woburn, and manufactured by the exhibiters; a patent portable thrashing machine of two-horse power, improved and manufactured by the exhibiters; two patent portable bolting thrashing machines of five-horse power, with a shaker to add (awarded 20*l.* at the Exeter Meeting in 1850, also a prize medal at the Great Exhibition, 1851), invented, improved, and manufactured by the exhibiters; a five-horse portable steam engine, improved and manufactured by the exhibiters; a small hand turnip drill, invented and improved by G. W. Baker, of Woburn, Beds, and manufactured by the exhibiters; and a turnip cutter for cattle, manufactured by the exhibiters.

Edward Hill and Co., of Brierley Hill Iron Works, near Dudley, and 53, Watling-street, City, London, and London-road, Derby.

Two wrought-iron skim or pair-horse scarifiers, invented, improved, and manufactured by the exhibiters (this implement obtained the first prize of its class at the Derby meeting, and, after trial at the Exeter meeting of the Society, was commended by the judges); (new implement) a wrought-iron pair-horse scarifier for small occupations, invented and manufactured by the exhibiters; eight different kinds of registered wrought-iron expanding horse-hoes, invented, improved, and manufactured by the exhibiters (obtained the Society's silver medal at the Exeter meeting); a wrought-iron sheep-rack, on four wheels, invented, improved, and manufactured by the exhibiters (at the Derby meeting of this Society, a silver medal was obtained by this implement); another wrought-iron sheep-rack, on four wheels, invented and manufactured by the exhibiters; a wrought-iron sheep-trough, on wheels, galvanized, a wrought-iron sheep-hurdle, on wheels, and wrought-iron garden-seats, No. 3 and 4, invented and manufactured by the exhibiters; three different sizes of wrought-iron rick-stands, on cast-iron pillars, improved and manufactured by the exhibiters; two patent 5-cwt. weighing machines, invented and manufactured by Day and Co., of Birmingham; a wrought-iron field-gate and wrought-iron posts, invented, improved, and manufactured by the exhibiters (at the Derby meeting of this Society, a silver medal was awarded to this gate and posts); three wrought-iron field-gates, invented and manufactured by the exhibiters; several wrought-iron field-gates, fitted to cast-iron pillars, two wrought-iron ornamental entrance-gates, with fluted cast-iron pillars, several wrought-iron ornamental hand-gates or garden-gates, and a wrought-iron footpath-gate, invented and manufactured by the exhibiters; a length of eave-guttering, for farm or other buildings, and a length of rain-water pipe, manufactured by the exhibiters; a sheep-hurdle for general purposes, invented and manufactured by the exhibiters; a cattle-hurdle for general purposes; and a wrought-iron ox-hurdle, manufactured by the exhibiters; several couple of wrought-iron sheep-feeding hurdles, manufactured by the exhibiters; several specimens of wrought-iron ox-hurdles, made game-proof, and a wrought-iron sheep-hurdle, made game-proof, manufactured by the exhibiters; several wrought-iron game-proof garden-hurdles, manufactured by the exhibiters; a length of premium continuous sheep-fence, several lengths of wrought-iron premium continuous cattle-fence, two lengths of wrought-iron premium continuous deer-fence, a wrought-iron garden-barrow for general purposes, a wrought-iron barrow, with apparatus for heating gas-tar, &c., a specimen of wire game-proof netting, consisting of six rolls, painted, specimen of game-proof plant-guards, consisting of six, and a set of cast-iron stable furniture, invented and manufactured by the exhibiters; a cast-iron ornamental garden-seat for four persons, and a cast-iron ornamental table, with flower-stand; a length of invisible strained wire ox-fence, invented and manufactured by the exhibiters.

John Holmes and Sons, of Norwich, Norfolk.

An improved portable six horse power steam engine; and an improved portable thrashing, shaking, and riddling machine, invented, improved and manufactured by the exhibiters (at the Great Exhibition the first prize medal was awarded to this implement); a combined improved thrashing, shaking, riddling, winnowing, and hummelling machine, portable or fixed, improved and manufactured by the exhibiters; an improved five horse power portable thrashing machine, with improved horse gear complete, invented and manufactured by the exhibiters; a model of J. Holmes and Son's Exhibition prize medal thrashing machine, with winnowing apparatus attached; (new implement) a Royal Society's Exeter prize manure distributor; a nine row lever corn drilling machine; and a three row lever manure, turnip, and mangold drilling machine, invented, improved, and manufactured by the exhibiters; (new implement) a lever harrow, to be drawn by one horse, invented and manufactured by the exhibiters; a corn dressing or winnowing machine; and a barley aveler or hummelling machine, invented, improved, and manufactured by the exhibiters; a one row lever manure, turnip, and mangold drill invented and manufactured by the exhibiters; a Royal Society's prize hand barrow two row lever drill, invented, improved, and manufactured by the exhibiters (this drill had the Royal Agricultural Society's prize awarded to it at Norwich); a one row lever hand turnip, and mangold drill, invented, improved, and manufactured by the exhibiters); (new implement) a corn reaping machine, improved and manufactured by the exhibiters.

John Eaton, of Woodford, near Thrapstone, Northamptonshire.

(New implement) a six-horse power portable steam engine, on wheels, invented and manufactured by William Batley, of Bridge-street Works, Northampton; an Eatou's patent one-horse cart, with harvest-raves complete, for general purposes, invented and manufactured by the exhibiter (a prize of £5 was awarded to this description of cart at the meeting held at York, 1848); (new implement) a registered economical and ornamental sheep crib, invented by William Knight, Esq., of Titchmarsh, improved and manufactured by the exhibiter; (new implement) an improved circular sheep crib, invented by William Knight. Esq., of Titchmarsh, improved by Mr. Toplis, of Boxted Farm, near Colchester, and manufactured by the exhibiter; and (new implement) a pair of hand seed dibbles, for wheat and other seeds, invented, improved and manufactured by the exhibiter.

Edward R. Turner and Co., of St. Peter's Foundry, near Ipswich, Suffolk.

A new linseed and corn-crushing machine; and a Turner's registered roller mill, for crushing linseed, oats, malt, &c., and breaking beans, invented and manufactured by the exhibiters; two sizes of a roller mill for crushing linseed, oats, malt, &c., invented by Bond, Turner, and Hurwood, of Ipswich, improved by Hurwood and Turner, and the exhibiters, and manufactured by the exhibiters (the prize of £5 was awarded for this mill to Hurwood and Turner at the Norwich Meeting of the Royal Agricultural Society); a Turner's registered roller mill (No. 2), for crushing linseed and corn, and breaking beans, invented and manufactured by the exhibiters; a small hand crushing mill, for oats and beans; a hand-mill for breaking beans; and a hand-box chaff cutter, with revolving fork, invented and manufactured by the exhibiters.

William Williams, of Bedford, Bedfordshire.

Six sets of patent four-beam diagonal iron harrows (these harrows obtained a prize at the Meeting of the Royal Agricultural Society at Derby, 1843; at Southampton, 1844; at Shrewsbury, 1845; at Northampton, 1847; at Norwich, 1849; and at Exeter, 1850; the prize medal was also awarded for these harrows at the Great Exhibition of 1851); and a patent horse rake, invented by Samuel Taylor, of Cotton End, improved and manufactured by the exhibiters (a prize was awarded for this implement at the Meeting of the Royal Agricultural Society at Southampton, 1844; at Norwich, 1849; and at the Royal Agricultural Society of Irelaud's Meeting at Dublin,

1851); two wrought iron scufflers or scarifiers, invented, improved, and manufactured by the exhibiter; a three-knife chaff-engine; a two-knife chaff-engine; and a chaff-engine with two knives, eight inches wide in the mouth-piece, improved and manufactured by the exhibiter; two patent wrought-iron ploughs, with two wheels, for general purposes; a mill for grinding beans and peas, and an improved iron corn mill, invented, improved, and manufactured by the exhibiter; two sizes of a machine for making draining pipes and tiles, invented by Messrs. Sanders and Williams, of Bedford, improved and manufactured by the exhibiter (awarded 25*l.* at the Northampton Meeting in 1847, and at Dublin in 1851); and two sizes of a wrought-iron horse hoe for one row, invented, improved, and manufactured by the exhibiter.

Burgess and Key, 103, Newgate-street, London.

A patent reaper, invented by Cyrus Hall M'Cormick, of Chicago, U.S., and manufactured by B. Samuelson, of Banbury, for the exhibiters, the agents to Mr. M'Cormick (received the Council Medal at the Great Exhibition of 1851); a model of a patent reaper, invented by C. H. M'Cormick, of Chicago, U.S., and manufactured by B. Samuelson, of Banbury, for the exhibiters; three sizes of a patent turnip cutter, invented by William Burgess, of London, and manufactured by Messrs. Horosby and Son, of Grantham, Lincolnshire (obtained the prize medal at the Great Exhibition of 1851); (new implements) five sizes of a new patent lift pump for liquid manure or water, invented by Robert Urwin, of London, and manufactured by the exhibiters; two sizes of a patent force and suction pump for gardens, invented by Mr. Kase, of the United States, improved and manufactured by the exhibiters; two gutta percha pumps, invented and manufactured by the Gutta Percha Company, of London; a galvanized iron lift pump, on tripod stand, improved and manufactured by the exhibiters; two galvanized iron lift pumps on tripod stands, invented, improved, and manufactured by the exhibiters; a registered tooth-roller chaff cutter, a patent chaff cutter, and a bean and oat mill, invented and manufactured by Richmond and Chandler, of Manchester, agents to the exhibiters; a model of a patent turnip cutter, invented by Wm. Burgess, of London, and manufactured by the exhibiters; (new implement) an improved winnowing machine, and (new implement) a grain cradle, or hand reaper, invented and manufactured by J. G. Grant, of Junction, U.S.—agents, the exhibiters; an American plough, No. 1, an American plough, No. 4, an American side hill or turnwrest plough, and an American subsoil plough, invented and manufactured by N. B. Starbuck, of Troy, U.S.—agents, the exhibiters; several specimens of a patent churn (American), invented by C. J. Anthony, of Pittsburgh, U.S., and manufactured by the exhibiters (obtained the prize medal at the Exeter Meeting in 1850, and a prize medal at the Great Exhibition of 1851); several rolls of gutta percha tubing, and several specimens of gutta percha suction pipe, invented and manufactured by the Gutta Percha Company, of London; several rolls of canvas hose, lined and coated with gutta percha, invented and manufactured by the exhibiters; a gutta percha corn sower, invented and manufactured by the Gutta Percha Company, of London: a roll of leather hose, manufactured by Messrs. Hepburn and Sons, of London; several specimens of gutta percha union-joint for connecting hose, invented by the exhibiters, and manufactured by the Gutta Percha Company, of London; three gutta percha jets and spreaders for distributing manure, invented and manufactured by the Gutta Percha Company, of London; a brass jet and spreader, manufactured by the exhibiters; several rolls of patent band for driving machinery, invented by Mr. Haines, of Old Ford, and manufactured by Messrs. Smith and Son, of Bow; three bundles of digging forks, a bundle of hay forks, a bundle of pitching forks, and a steel spade, invented by Mr. Parkes, of Birmingham, and manufactured by Messrs. Winter and Sons, of Birmingham; two gutta percha stable pails, and four rolls of flat gutta percha band for machinery, invented and manufactured by the Gutta Percha Company, of London; a sack holder, invented and manufactured by Richmond and Co., of Manchester; two self-adjusting scythes, invented by Mr. Boyd, and manufactured by Messrs. Dean, Dray, and Co., of London; three coils of round gutta percha band, invented and manufactured by the Gutta Percha Company, of London.

Hugh Carson, Warminster, Wiltshire.

A seven-share scarifier, invented, improved, and manufactured by the exhibiter; a subsoil plough, invented and manufactured by the exhibiter; a wrought iron one-wheel plough (marked No. 7) for strong land, and a wrought iron one-wheel plough for light lands (marked No. 8), improved and manufactured by the exhibiter; a set of six iron harrows, invented and manufactured by the exhibiter; a wrought iron scuffling plough, invented, improved, and manufactured by the exhibiter; a chaff and litter engine, improved and manufactured by the exhibiter; a chaff engine (No. 2), invented and manufactured by the exhibiter; a patent turnip cutter, invented by Edmund Moody, of Maiden Bradley, improved and manufactured by the exhibiter; a corn crusher, an oilcake crusher, a double cheese press, and a single cheese press, improved and manufactured by the exhibiter; a malt mill, invented, improved, and manufactured by the exhibiter.

John Every, jun., of Lewes, Sussex.

An iron land roller 3 feet diameter, one 2 feet 6 inches, one 2 feet diameter, and one 1 foot 6 inches diameter, improved and manufactured by the exhibiter; a two-wheel land presser, with iron frame, invented and improved by J. Every, sen., of Lewes, and manufactured by the exhibiter; a five-wheel land presser, manufactured by the exhibiter; a wrought iron cattle crib, invented and improved by Mr. Thomas Lambe, of Wilmington, Sussex, and manufactured by the exhibiter; a large iron cattle trough, manufactured by the exhibiter; two large turnip cutting engines for steam or horse power, improved by J. Every, sen., and manufactured by the exhibiter.

Thomas Freer, of Uppingham, Rutlandshire.

A plough for general purposes, and a plough for deep ploughing, invented, improved, and manufactured by the exhibiter.

Thomas Nixon, of Rothwell, near Kettering, Northamptonshire.

A one-light garden frame, and a two-light garden frame, the method of glazing same registered, (new implement) a 24-inch garden frame, and (new implement) a 21-inch metallic garden hand frame, on a new construction, invented and manufactured by the exhibiter; a 19-inch metallic garden hand frame, manufactured by the exhibiter; a specimen of Nixon's registered metallic self ventilating garden and skylight bar, invented and manufactured by the exhibiter; a specimen of zinc eaves gutter, manufactured by the exhibiter; a valise of samples, containing specimens of Nixon's oil stain, invented and manufactured by the exhibiter.

Abraham Pridmore, of Thorpe Satchville, near Melton Mowbray, Leicestershire.

(New implement) a double blast winnowing machine, for dressing all kinds of corn, invented by Pridmore and Son, of Thorpe Satchville, improved and manufactured by the exhibiter; a double blast machine for dressing all kinds of corn and small seeds, invented by the exhibiter.

William Carpenter, of Banbury, Oxfordshire.

A patent anti-attrition bolting thrashing box, improved and manufactured by the exhibiter; a patent four horse gear work, invented and manufactured by Barrett, Exall, and Andrews, of Reading.

Richard Pitts, of Kenn, near Exeter, Devonshire.

(New implement) a one-way or turnwrest plough, invented by the exhibiter; and a light plough for general purposes, invented and improved by the exhibiter, and both manufactured by John Eddy, of Kenford.

Barrett, Exall, and Andrews, of Katesgrove Works, near Reading, Berkshire.

(New implement) a six horse power portable steam engine, (this engine obtained the commendation of the Society at Exeter, and the prize medal of the Great Exhibition, 1851), a four horse power portable steam engine, an eight horse power fixed cylinder engine, a five horse power fixed cylinder steam engine, a three horse power fixed cylinder steam engine, and a six horse power portable thrashing machine, invented and manufactured by the exhibiters; a six horse power thrashing machine, invented, improved, and manufactured by the exhibiters; a four horse power portable thrashing machine, a four horse power thrashing machine, with straw shaker, a three horse

patent iron thrashing machine and patent safety horae gear, a two horse portable patent thrashing machine and patent safety horse gear (it had awarded to it the commendation of the Society at Exeter, and the medal of the Great Exhibition, 1851), a patent hand power thrashing machine, a patent one horse power or hand thrashing machine, a patent two horse safety gear, a one horse power patent safety gear, a pair of 24-inch peak stones for grinding, (new implement) a new metal mill for grinding, a mill for crushing oats, malt, and linsced, a mill for crushing oats, malt, and linsced, a paragon or universal grain mill, a paragon or universal mill for crushing grain, and (new implement) three specimens of a patent paragon chaff cutter, invented and manufactured by the exhibitors; a chaff cutting machine, invented by Mr. John Cornes, of Barbridge, and manufactured by the exhibitors (thia machine has gained several prizes from the Royal Agricultural Society); two oilcake crushers, a double action crusher for rape and other cake, a gorse bruising machine (this machine obtained the prize of this Society at York, also at the Society's meeting at Norwich, of £5 each time, and was commended by the judges at the Great Exhibition, 1851), a corn cleaner or blower, a corn cleaner or blower with feed rollers, an improved winnowing machine, a barley hummeller for hand power, a barley hummeller for hand or one horse power, and a double cylinder field roller, all invented and manufactured by the exhibiters; a patent clod crusher or press wheel roller, invented by W. C. Cambridge, of Bristol, and manufactured by the exhibiters; (new implement) a patent horse rake for hay, &c., and a registered haymaking machine, invented and manufactured by the exhibiters; an Uley cultivator, invented by Mr. John Morton, of Whitfield, improved by Mr. R. Clyburn, of Uley, and manufactured by the exhibiters; a set of patent iron harrows with whippletree, invented by W. Armstrong, of Bedford, and manufactured by the exhibiters; a set of jointed iron harrows, invented by W. Armstrong, of Bedford, improved by J. Howard, of Bedford, and manufactured by the exhibiters; a set of light iron drags and whippletree, and a set of heavy iron drags and whippletree, invented by W. Armstrong, of Bedford, and manufactured by the exhibiters; (new implement) an XL iron two wheel and awing plough, invented and manufactured by the exhibiters; an XL two wheel iron plough for deep ploughing, invented, improved, and manufactured by the exhibiters; a two wheel Berkshire plough, G.A.B., and A.D.P. 2 one wheel plough, invented and manufactured by the exhibiters (this last plough obtained the prize of £5 at the Royal Agricultural Society at Liverpool, as the lightest of draught); a patent subsoil plough, invented by Mr. John Read, of London, improved and manufactured by the exhibiters (this plough obtained the following prizes awarded by the Royal Agricultural Society:—£10 at Southampton, Shrewsbury, Newcastle, Northampton, and York); a two share subsoil plough, and a model of patent safety horse gear, invented and manufactured by the exhibiters.

Robert Ransome (for Self and Partners), Ipswich, Suffolk.

Several patent iron ploughs, with two wheels, invented, improved, and manufactured by the exhibiters (awarded the prize of 10*l.* and silver medal as the best heavy land plough; a prize of 10*l.* and silver medal as the best light land plough, at the Royal Agricultural Society's meeting at Southampton; also a prize of 10*l.* at the Royal Agricultural Society's meeting at Northampton; and the Council Medal of the Great Exhibition, with this plough as made by Busby); several patent iron ploughs with one wheel, invented, improved, and manufactured by the exhibiters; a patent iron plough with two wheels, marked Y S H, invented and manufactured by the exhibiters, improved by H. Dickson, of Welling, Kent; a patent iron plough, fitted with wheels and skim coulter, marked YL, invented by the exhibiters, improved and manufactured by W. Busby, of Bedale, Yorkshire (obtained the prize at the Great Exhibition as the best heavy land plough); (new implements) two new patent iron ploughs with two wheels, invented, improved, and manufactured by the exhibiters; a double furrow plough, with patent trussed beams, invented, improved, and manufactured by the exhibiters; a patent iron subsoil plough, Y. Rackheath, invented by Sir E. Stracey, of Rackheath, improved and manufactured by the exhibiters; a patent iron one-way Lowcock's plough, with two wheels and skim coulters, marked LP, invented by Henry Lowcock, of Westerland, improved and manufactured by the exhibiters (obtained a prize of 5*l.* at the Royal Agricultural Society's meeting at Southampton); a patent iron double mould-board plough, with one wheel, marked YDF, invented, improved, and manufactured by the exhibiters; a patent trussed beam iron universal plough, marked YUL, invented by J. Clarke, of Long Sutton, improved and manufactured by the exhibiters (obtained the silver medal at the meeting of the Royal Agricultural Society at Norwich, 1849); three patent iron universal ploughs as a moulding plough, invented by J. Clark, of Long Sutton, improved and manufactured by the exhibiters; an improved Kent two-horse plough, with wood beams and handles, gallowses, and wheels, marked WSR, invented by William Smart, of Rainham, Kent, improved and manufactured by the exhibiters; a plough with wood beam, double handles, and wheels, marked A, another marked NL and a plough with wood beam and handles, and one wheel, marked MT, invented and manufactured by the exhibiters; an iron broad-share plough and scarifier, marked BUL, invented by Mr. Woods, of Stowmarket, improved and manufactured by the exhibiters; an iron skim or paring plough, a patent trussed beam iron plough, called the Y trenching or draining plough, a patent iron broad-share plough, scarifier, and subsoiler, and a trussed beam subsoil plough, marked ZUL, invented, improved, and manufactured by the exhibitera; a new double tom or moulding plough (Dickson's), invented by W. Dickson, of Welling, Kent, improved and manufactured by the exhibiters; a registered Tennant's grubber, invented by John Tennant, of Shields, Ayrshire, improved and manufactured by the exhibiters; a set of patent trussed iron Whippletrees, invented, improved, and manufactured by the exhibiters (obtained the Royal Agricultural Society's silver medal at Southampton); two sets of Biddell's patent wrought-iron scarifiers, grubbers, or cultivators, marked No. 2, invented by Arthur Biddell, of Ipswich, improved and manufactured by the exhibiters (awarded the Royal Agricultural Society's prize of 10*l.* at Liverpool, at Northampton, at York, at Norwich, and the prize medal at the Great Exhibition, 1851); a wrought-iron suspension harrow and light scarifier, invented, improved, and manufactured by the exhibiters; a Croskill's patent clod crusher (size 6 ft.), invented, by W. Crosskill, of Beverley, manufactured by the exhibiters; a Hussey's reaping machine, with registered improvements, invented by Hussey, of America, improved by Richard Garratt, of Leiston, and manufactured by the exhibiters; a Smith's patent lever horse rake, invented by Smith and Son, of Stamford, and manufactured by the exhibiters; (new implement) an eight-horse portable steam engine, (new implement) a six-horse portable steam engine, (new implement) a four-horse portable steam engine, (new implement) an eight-horse power stationary steam engine, (new implement) a three-horse power horizontal stationary steam engine, (new implement) a seven-horse power horizontal stationary steam engine, (new implement) a portable steam engine and corn mill combined, a two-horse portable thrashing machine, a three-horse thrashing machine, a four-horse portable bolting thrashing machine, (new implement) an improved portable or fixed six-horse bolting thrashing machine, with straw shaker, winnowing machine, a No. 2 dressing machine, a barley awner, No. 2, a patent chaff engine with two knives, two patent iron chaff engines, a hand power chaff cutter with one knife, (new implement) a chaff cutter, No. 17, for hand power, with two knives, (new implement) a horse power chaff cutter, No. 16, and (new implement) an iron chaff cutter, No. 19, with two knives, all invented, improved, and manufactured by the exhibiters; a Gardner's turnip cutter, for sheep, with grated hopper, and a Gardner's double action turnip cutter, for sheep and beasts, invented by Mr. Gardner, of Banbury, improved and manufactured by the exhibiters; (new implement) a turnip cutter, fitted with bruising rollers, invented, improved, and manufactured by the exhibiters; a Hurwood's patent 12-inch metal mill, invented by George Hurwood, of Ipswich, and manufactured by the exhibiters (this mill obtained a prize medal at the Great Exhibition of 1851;) a patent double mill No. 8 for horse power a No. 6 patent double crushing mill for hand power, a patent double mill No. 7, a spiral oat mill No. 2 for hand power, a spiral bean mill No. 2 for hand power, a hand power linseed mill, and an oilcake breaker No. 8, invented, improved, and manufactured by the exhibiters; a bean mill for hand power, No. 9, invented by Samuelson, of Banbury, improved and manufactured by the exhibiters; a set of two-horse horse works, and

an iron universal intermediate motion, invented, improved, and manufactured by the exhibiters; a 19-inch Budding's grass cutting machine, invented by Budding of Dursley, and manufactured by the exhibiters; an improved one-horse Scotch cart, complete, with harvest raves, and an improved Cumberland cart, with harvest raves, invented, improved, and manufactured by the exhibiters; a pair of Sillett's forks, invented by Sillett, of Kelsale, improved and manufactured by the exhibiters; a patent corn and seed depositor, invented, improved and manufactured by the exhibiters (this implement was awarded a silver medal at Norwich, and the prize medal at the Great Exhibition of 1851).

George Hurwood, Ipswich, Suffolk.

Several specimens of Hurwood's patent metal mill (B), invented by the exhibiter, and manufactured by Ransome and Sims, of Ipswich (obtained prize medal at the Great Exhibition, 1851); a case containing four specimens or models of patent ventilating windows, invented and manufactured by the exhibiter (obtained honourable mention at the Great Exhibition, 1851); a case containing various models in brass of Hurwood's patent window movements, invented by the exhibiter (obtained honourable mention at the Great Exhibition, 1851); a case containing model plate and stand of Hurwood's patent mill, invented by the exhibiter, and manufactured by Ransome and Sims, of Ipswich.

Thomas, Robert, and J. Reeves, of Bratton, near Westbury, Wilts.

A patent liquid-manure distributor or cart (obtained a prize of 10*l.* at the Royal Agricultural Society's meeting at Exeter, 1850, also a prize medal at the Great Exhibition, 1851), and a patent liquid-manure drill (obtained the silver medal at the Royal Agricultural Society's Meeting at York, 1848, since which time it has been much improved; also the prize of 5*l.* at the Royal Agricultural Society's Meeting at Norwich, as a liquid distributor; and also a prize medal at the Great Exhibition, 1851), both invented by Mr. Thomas Chandler, of Aldbourne, and improved and manufactured by the exhibiters; (new implement) a registered guard frame pig trough, invented by John Keable, of Lambourne, Berks, and manufactured by the exhibiters; (new implement) an iron plough for general purposes, invented, improved, and manufactured by the exhibiters.

Robert Cogan, of 48, Leicester Square, London.

A selection of glass milk pans; a collection of dairy articles in glass, invented and manufactured by the exhibiter; a collection of lactometers in sets of 4 in a wooden stand, graduated to denote the quantity or per-centage of cream produced from milk; a syphon, invented by Lord Camoys, of Henley-on-Thames, and manufactured by the exhibiter; glass tiles and slates for farm purposes, and flat stout glass for ditto, farmers' lanterns, and various other dairy glass.

Henry Atwood Thompson, of Lewes, Sussex.

Double cylinder land rollers, 14, 16, 18, and 20 inches in diameter, with pair oak rods, and extra strong double cylinder land rollers, 18, 20, 22, 24, and 26 inches diameter, with double rods for horses or oxen, all invented and manufactured by the exhibiter; a patent serrated roller or clod crusher, invented by William Crosskill, of Beverley, manufactured by Ransomes and Sims, of Ipswich (this implement was awarded a prize of 20*l.* and silver medal at Southampton, 10*l.* at Shrewsbury, and the special award of a gold medal at Newcastle; two Norwegian harrows or clod crushers, invented by G. E. Frere, Esq., of Roydon Hall, Norfolk, and manufactured by Stratton and Co., of Bristol (a prize of 10*l.* was awarded to it at Shrewsbury, as a new implement; also a prize of £5 at Newcastle); a two-wheel seam presser, invented, improved, and manufactured by the exhibiter; a two-wheel, five-wheel, and seven-wheel seam presser, manufactured by the exhibiter; a Biddell's patent scarifier, grubber, or cultivator, invented by Arthur Biddell, of Playford, and manufactured by Ransomes and Sims, of Ipswich (this implement obtained the prize of 10*l.* at Liverpool, 10*l.* at Northampton, and 10*l.* at York); (new implement) a Johnson's patent skim or broadshare cultivator, and (new implement) a one-horse cart and Johnson's skim cultivator combined, both invented by Rev. E. H. Johnson, of Gravelye Lindfield, Sussex, and improved and manufactured by the exhibiter; an improved one-horse Scotch cart, complete with harvest raves, manufactured by Ransomes and Sims of Ipswich; a one-horse improved Scotch cart, manufactured by William Crosskill, of Beverley; (new implement) an improved water and liquid-manure cart and irrigator, invented by H. Wood, Esq., of Ovendean, Sussex, and improved and manufactured by the exhibiter; a lever drill for corn and seeds, manufactured by R. Hornsby and Son, of Grantham, Lincolnshire; a drill for general purposes, and a patent lever horse-hoe, both manufactured by Garratt and Sons, of Saxmundham, Suffolk; a swing steerage horse-hoe, three single-row drills for seeds and manure, a two-row expanding drill for seeds, and a barrow broadcast drill, all manufactured by the exhibiters; (new implements) two American reaping machines, invented by Hussey, of America, and manufactured by Wm. Dray and Co., of London; a lever horse-rake, invented by Samuel Taylor, of Cotton End, and manufactured by William Williams, of Bedford (this was awarded a prize of 5*l.* at Southampton, and 5*l.* at Norwich); a lever horse-rake, invented by Smith and Co, of Stamford, and improved and manufactured by Ransomes and Sims, of Ipswich; a lever horse-rake, manufactured by Barrett, Exall, and Andrews, of Reading; a double action hay-making machine, and a double action hay-making machine with guard board, both invented by Robert Wedlake, of Hornchurch, and improved and manufactured by the exhibiter; a hand power patent thrashing machine, a two-horse power portable patent thrashing machine and patent gear work, and a three-horse power portable patent thrashing machine and patent gear work, all manufactured by Barrett, Exall, and Andrews, of Reading; an improved winnowing machine, a much-improved winnowing machine, and a corn blower or cleaner, all manufactured by the exhibiter; a barley aveler or hummeller, manufactured by Barrett, Exall, and Andrews, of Reading; a barley aveler or hummeller, manufactured by Garratt and Sons, of Saxmundham, Suffolk; a barley aveler or hummeller, a patent trussed beam Iron plough (marked YE) with one wheel, a patent trussed beam iron plough (marked YFL) to swing, and a patent trussed beam iron plough (marked YFL) with two wheels, all manufactured by Ransomes and Sims, of Ipswich; a patent trussed beam iron plough (marked YLL) with two wheels, invented, improved, and manufactured by Messrs. Ransomes and Sims, of Ipswich (awarded the prize of 10*l.* and silver medal as the best heavy land plough, a prize of 10*l.* and silver medal as the best light land plough at the R. A. Society's meeting at Southampton, also a prize of 10*l.* at Northampton, and the Council Medal of the Great Exhibition, with this plough as made by Busby); three patent trussed beam iron ploughs (marked YL) with double wheels, and a patent trussed beam iron plough (marked YSH) with double wheels, both manufactured by Ransomes and Sims, of Ipswich; a patent iron plough (marked JA) with two wheels, manufactured by Howard and Son, of Bedford; an improved pulverizing plough, invented by Mason, of Warwickshire, and manufactured by the exhibiter; a double furrow plough with patent trussed beams (marked YRR), manufactured by Ransomes and Sims, of Ipswich; a patent trussed beam iron plough, called "Lowcock's Patent Plough," invented by Henry Lowcock, of Waterland, and manufactured by Ransomes and Sims, of Ipswich (this plough obtained a prize of 5*l.* at Southampton); a patent trussed beam iron snap plough with one wheel, and a plough with wood beam, double handles, and gallowses (marked WSR), both invented by William Smart, of Rainham, Kent, and manufactured by Ransomes and Sims, of Ipswich; a plough with wood beam, double handles, and gallowses (marked DP 2), manufactured by Barrett, Exall, and Andrews, of Reading; a Hampshire wheel plough (marked T), manufactured by Ransomes and Sims, of Ipswich; a wood beam Sussex turnwrest plough, with wheels and gallowacs, and (new implement) a strong wood beam Sussex turnwrest plough with wheels and gallowses, both manufactured by the exhibiter; (new implement) a swing Sussex turnwrest and surface drain plough, invented by John Catt, Esq., of Stoneham, Sussex, improved and manufactured by the exhibiter; a wood beam Kent turnwrest plough (marked TRL), manufactured by Ransomes and Sims, of Ipswich; a Read's subpulverizing plough (a prize of 10*l.* was awarded to this implement at Shrewsbury), and a Read's subpulverizing plough with scarifier, both invented by John Read, of Regent's Circus, London, and manufactured by the exhibiter; (new implement) wrought-iron subpulverizing plough, manufactured by the exhibiter; a subsoil plough called the "Rackheath," invented by Sir Ed-

ward Stracy, Bart., of Rackheath, and manufactured by Ransomes and Sims, of Ipswich; a subsoil plough, manufactured by the exhibiter; a plough, with wood beam, double handles, and wheels (marked A), a plough with wood beam and double handles (marked S G), and a moulding or double tom plough (marked DT), all manufactured by Ransomes and Sims, of Ipswich; a Clarke's universal ridge plough (marked YUL), invented by John Clarke, of Long Sutton Marsh, and manufactured by Ransomes and Sims, of Ipswich; a patent broadshare and subsoil plough combined, invented and manufactured by E. H. Bentall, of Heybridge, Essex; a broadshare and subsoil plough combined (marked ZUL), manufactured by Ransomes and Sims, of Ipswich; a turf and stubble paring plough, manufactured by Thomas Glover, of Thrussington, Leicestershire; an iron broadshare plough and scarifier (marked DUL), invented by Mr. Woods, of Stowmarket, and manufactured by Ransomes and Sims, of Ipswich; a wrought-iron horse-hoe scarifier, and a strong wrought-iron horse-hoe scarifier, both manufactured by the exhibiter; a horse-hoe plough, with wood beam, manufactured by Ransomes and Sims, of Ipswich; a wood beam expanding horse-hoe, and two wrought-iron horse-hoes, both manufactured by the exhibiter; a set of one-horse, two-horse, and three-horse patent diagonal iron harrows, invented by Samuel Taylor, of Cotton End, and manufactured by William Williams, of Bedford; a set of patent trussed iron whippletrees, manufactured by Ransomes and Sims, of Ipswich; three skim coulters, manufactured by the exhibiter; hand-power chaff cutters, with one knife, two knives, and three knives, invented and manufactured by Ransomes and Sims, of Ipswich; chaff engines, with two knives and three knives, manufactured by Richmond and Chandler, of Salford; a hand-power Guillotine chaff engine, manufactured by John Gillett, of Brailes, near Shipston-on-Stour; a registered Cam chaff-engine, manufactured by Barrett, Exall, and Andrewes, of Reading; hand-power chaff-engines, with one and two knives, invented and manufactured by Ransomes and Sims, of Ipswich; a hand or horse-power chaff-engine, with one knife, manufactured by the exhibiter; registered chaff-engines, with two and three knives, invented and manufactured by John Cornes, of Barbridge, Cheshire (this machine gained a prize of £10, at Shrewsbury, at Newcastle, at Northampton, and at Norwich, and the Society's silver medal at York); a hand-power bean mill (No. 9), invented by Mr. Samuelson, and manufactured by Ransomes and Sims, of Ipswich; a hand-power bean mill, invented by Mr. Seammens, and manufactured by the exhibiter; a linseed or oat-crushing mill, and a linseed or oat-crushing mill for horse power, manufactured by the exhibiter; the "paragon" universal grain mill, manufactured by Barrett, Exall, and Andrews, of Reading; a patent double crushing mill for hand power, manufactured by Ransomes and Sims, of Ipswich; a duplex flour mill, invented by Luke Hebert, and manufactured by Ransomes and Sims, of Ipswich; a flour mill with stones, an oil-cake breaker, an oilcake breaker, a double roller oilcake breaker, and a lever turnip cutter, manufactured by the exhibiter; a disc turnip cutter on stand and a disc turnip cutter on barrow, manufactured by Ransomes and Sims, of Ipswich; a Gardner's patent turnip cutter, invented by James Gardner, of Banbury, and manufactured by the exhibiter; a double action Gardner's turnip cutter, invented by James Gardner, of Banbury, and manufactured by Ransomes and Sims—a prize of £5 was awarded to this machine at Norwich; a double action disc turnip cutter, a revolving root washer, (new implement) a portable steam generator, and (new implement) a paragon portable steaming apparatus, manufactured by the exhibiter; (new implements) improved portable coppers to hold eight and sixteen gallons, invented and manufactured by the exhibiter; (new article) a sample of four galvanized cast-iron furnaces, invented and manufactured by Morewood and Rodgers, of London; an improved cheese and cider press, a cast-iron cider press, a waggon-lifting screw jack, two coal-weighing machines with iron hopper, an improved weighing machine for sacks, and an improved granary weighing machine, manufactured by the exhibiter; a patent sack holder, invented by Henry Gilbert, of London, and manufactured by the exhibiter; an iron sack barrow, two iron corn screens, a navigator's iron wheelbarrow, an iron garden wheelbarrow, an iron stable wheelbarrow, a wrought-iron heating barrow, a cast-iron garden roller, and a large garden roller for pony, all manufactured by the exhibiter; a Budding's grass cutter, invented by Budding, of Dursley, and manufactured by Ferrabee and Son, of Strond; a garden engine in wood pail, a garden engine in oval tub on wheels, and a large garden engine in oval tub on wheels, manufactured by Warner and Sons, of London; a steel daisy rake, manufactured by Hunt and Sons, of Birmingham; (new implement) an improved daisy Rake, invented by W. B. Thomas, of Ratton, Sussex; improved and manufactured by the exhibiter; a steel tooth hand rake, manufactured by the exhibiter; a lever hand rake, invented by Smith, of Stamford, and manufactured by Ransomes and Sims, of Ipswich; a registered hand cultivator and Drill hoe, and a patent hand seed dibble, invented by Dr. Newington, of Frant, Sussex, and manufactured by Wedlake and Thompson, of Hornchurch—this last implement gained the prize of £3 at Norwich in 1849; a two steel breast or dentshare plough, manufactured by Hunt and Sons, of Birmingham; two sets of steel draining tools, manufactured by W. A. Lyndon, of Birmingham; the "Markly" Draining Tool, invented by George Darby, Esq, of Markly House, Sussex, improved by the exhibiter, and manufactured by Hunt and Sons, of Birmingham; an assortment of draining tools, manufactured by Hunt and Sons, of Birmingham; an assortment of steel digging and dung forks, manufactured by Harry Winton, of Birmingham; an assortment of steel hay prongs, manufactured by Hunt and Sons, of Birmingham; a set of wrought steel waggon hamea, manufactured by the exhibiter; a draining level, called the A level, invented by Bailey Denton, of London, and manufactured by Messrs. Jones, of London; a Blundell's improved draining level, invented by Blundell, and manufactured by Horne, Thornthwaite, and Wood, of London; a specimen of three small-sized, three middle-sized, and three large-sized wrought iron pails, and a wrought iron trug basket, each small and large, manufactured by the exhibiter; (new implement) a set of bright cast steel measures for corn or seeds, invented, improved, and manufactured by the exhibiter; a wood bushel measure of four qualities, manufactured by W. Ranford, of London; (new implement) three improved tin square box churns, invented, improved, and manufactured by the exhibiter; four improved Sussex churns, manufactured by the exhibiter; a tin Ballyclare churn, invented by John Rowan and Sons, of Ballyclare, manufactured by Richard Robinson, of Belfast (this principal churn obtained a prize of 5*l.* at Newcastle, and 5*l.* at Northampton); three improved wood-box churns, and (new implement) an improved barrel churn for horse or hand power, all manufactured by the exhibiter; (new implement) a specimen of three enamelled wrought-iron milk pans, manufactured by Walton and Co., of Wolverhampton; four cast-iron well pumps, manufactured by the exhibiter; (new implement) four sizes of Warner's patent iron pump, manufactured by Warner and Sons, of London; two sizes of a portable liquid manure pump, and a cast-iron liquid manure pump for a fixture (six-inch), all manufactured by the exhibiter; (new implement) a Warner's patent portable force pump, manufactured by Warner and Sons, of London; (new implement) a portable iron pump on tripod stand, with flexible hose, invented and manufactured by the exhibiter; (new implement) a Warner's patent portable force pump on carriage, manufactured by Warner and Sons, of London; (new implement) a liquid manure irrigator and farmer's fire engine, invented and manufactured by the exhibiter; (new implement) the farmer's fire engine, an iron frame with force pump, an engine frame for working a single barrel pump in a deep well, a 3-inch brass deep well pump, and a patent brass force pump on plank, manufactured by John Warner and Sons, of London; a water ram, invented by J. M. Montgolfier, and manufactured by John Warner and Sons, of London; several sized cattle water troughs, several sizes of cast-iron stall troughs, (new implement) a cast-iron pig trough with feeding door, cast-iron circular pig troughs, for 5, 6, or 8 pigs, cast-iron mangers 3 and 6 feet long, a cast-iron corner manger, a cast-iron hay rack, and a cast-iron corner hay rack, all manufactured by the exhibiter; (new implement) a round wrought iron cattle crib, invented by Mr. Thos. Lambe, of Wilmington, Sussex, improved and manufactured by the exhibiter; a square wrought iron cattle crib, manufactured by the exhibiter; (new implement) a round wrought iron sheep crib, invented by Mr. Richard Woodman, of Glynde, Sussex, improved and manufactured by the exhibiter; a set of 9 cast-iron rick stands, a wrought iron rick frame on cast-iron stands, a sample of 3 cast-iron cottage casements, a cast-iron gothic top casement, a sample of 6 cast-iron

diamond quarry casements, two pair of fancy cast-iron casements to open, (new implement) a sample of three galvanized wrought iron fancy lodge casements, one and two-light cast-iron cucumber frame, a cast-iron hand glass frame of five sizes, two wrought iron Scotch field gates and standards, a fancy wrought iron wicket gate and standards, a cast-iron gothic wicket gate and standards, a cast-iron Grecian gate and standards, a cast-iron gothic gate with standards, and a pair of cast-iron gothic entrance gates with standards, all manufactured by the exhibiter; (new implement) two improved wood and iron trussed field gates, invented, improved, and manufactured by the exhibiter; (new implement) an improved wood and iron trussed park gate, (new implement) a set of three improved entrance gates with cast-iron piers, several specimens of wrought iron hurdles, specimens of bowed park fence for wood posts, (new implement) a specimen of improved invisible wire fence, (new implement) a specimen of ornamental wire park fence, and an improved wrought iron step stile, all manufactured by the exhibiter; a bundle of the best charcoal iron fencing wire, manufactured by the proprietors of Tintern Abbey Works; a bundle of wire peg lattice, 18 and 24 inches wide, and a bundle of galvanized wire peg lattice, 24 inches wide, both manufactured by Bedford and Co., of London; two ornamental iron garden arches, two umbrella wire flower trainers, a balloon wire-flower trainer, an improved sweat-pea trainer, a strong wrought iron tree guard, and an umbrella wire flower trainer, manufactured by the exhibiter; a cottager's stove, invented by John Grant, of London, manufactured by Bailey and Co., of London.

EDWARD CRAWLEY, of 157, Upper Whitecross-street, London.

A steam engine, invented by W. K. Whytehead, of 69, Cornhill, and manufactured by the exhibiter; a patent sluice cock, invented by Mr. Ovid Topham, of London, and manufactured by the exhibiter.

JAMES WOODS, of Stowmarket, Suffolk.

(New implement) a four-horse power thrashing machine, improved and manufactured by the exhibiter; a one-horse power for driving machinery; a Suffolk one-horse cart, and harvest cart combined; and an emigrant's one-horse cart, invented and manufactured by the exhibiter; (new implement) an improved broadshare and general cultivator, called the Gloucestershire broadshare; and (new implement) an improved cultivator or scarifier, improved and manufactured by the exhibiter; a reaping and mowing machine, invented by Hussey, of America, improved and manufactured by the exhibiter; (new implement) a set of scarifying harrows, invented, improved, and manufactured by the exhibiter; two iron ploughs for general purposes, invented and manufactured by the exhibiter; two crushing and grinding mills, improved and manufactured by the exhibiter; an improved weighing machine, and a bean mill on iron frame, invented and manufactured by the exhibiter; a universal plough or horse hoe, invented by John Clark, of Long Sutton, improved and manufactured by the exhibiter.

DANIEL BAKER, of Shoreham, Sussex.

Three light harrows; and three heavy harrows, invented and manufactured by the exhibiter.

MICHAEL JOSEPH JOHN DONLAN, of Hammersmith, Middlesex.

A farmers' flax machine, invented and manufactured by the exhibiter.

J. DULEY and SONS, of Northampton.

(New implement) a large farm kitchen range (patented), invented, improved, and manufactured, by the exhibiters; (new implement) a very complete farm kitchen range; (new implement) a range calculated for a farm house or bailiff's cottage; (new implement) a range adapted for a small farm; (new implement) a cottage range; (new implement) two sizes of a patent cottage range; (new implement) a patent small cottage range for farm labourers; and (new implement) a patent self-acting effluvia trap for drains of all kinds (registered), all invented and improved by John Duley, of Northampton, and manufactured by the exhibiters.

CHARLES H. GABRIEL, of 24, Arundel Street, Strand, London.

A horse drill; a manure distributor; and a single-wheel manure distributor, invented by S. Newington, Esq., of Ticehurst, and manufactured by H. Bex, of Lamberhurst.

JOHN JAMES and Co., 24, Leadenhall Street, London.

(New implement) a 10-ton weigh bridge; a 4-ton; a 3-ton (this implement obtained a prize of £10 at each of the Society's meetings at Derby, Shrewsbury, Newcastle, and Northampton); a 21-cwt.; a 10-cwt.; a 6-cwt.; and two 3-cwt. weighing machines, all invented and manufactured by the exhibiters.

THOMAS PETERSON, Trinity Chambers, London.

A case of 12 glass milk pans, imported from Germany by the exhibiter; patterns of seamless canvass hose and fire buckets, improved and manufactured by Burbach Brothers, of Hörselgan, Germany; and a case of samples of linseed and other oilseed cakes.

WILLIAM PIERCE, of Jermyn Street, London, Middlesex.

Several specimens of a cottager's grate, made of fire clay and fire lump, invented and manufactured by the exhibiter; a fire lump grate for warming two rooms, invented, improved, and manufactured by the exhibiter; a plain grate with the back of fire lumps, and an improved grate for warming two rooms, improved and manufactured by the exhibiter; two warming and ventilating stove grates (this stove grate has been honoured by the large silver medal of the Society of Arts in June, 1849), and a new fire lump grate for burning either wood or coals, invented and manufactured by the exhibiter; a cottage range with oven and boiler, a strong range adapted for a bailiff's cottage, and a superior range adapted for a farm kitchen, invented and manufactured by W. Nicholson of Newark; a neat pattern grate for bedrooms with fire lump back, improved and manufactured by W. Nicholson, of Newark; and an improved sink, drain trap, and pump, invented and manufactured by W. Nicholson, of Newark; two sets of stable fittings for a loose box in stable, two ventilating stall divisions for a stable, and two improved sets of stable fittings, improved and manufactured by S. Hood and Co., London.

JOSEPH SIMMONS, of Rainham, near Sittingbourne, Kent.

An improved turnwrest plough adapted for heavy and light lands, and an improved turnwrest plough adapted for light soils, improved by Mr. Wm. Smart, of Rainham, manufactured by the exhibiter; a five rowed corn and seed drill, and a carrot drill, invented, improved, and manufactured by the exhibiter.

JOHN TILMAN, of Lewes, Sussex.

(New implement) a hand drill, invented and manufactured by the exhibiter; (new implement) a blower, manufactured by the exhibiter; a chaff cutter for hand power, (new implement) a small turnip or mangel drill, a corn dressing machine, and (new implement) a three horse portable thrashing machine, invented and manufactured by the exhibiter; and a hand thrashing machine to be worked by four men, improved and manufactured by the exhibiter.

C. HALSTED and SONS, of Chichester, Sussex.

(New implement) an iron plough (mark H 1), invented and manufactured by the exhibiters; two iron ploughs (mark H 3 and H 4), an iron plough, a one wheel plough, a two wheel plough, a one wheel plough (mark H 5), a four horse power thrashing machine, and an oilcake breaker, improved and manufactured by the exhibiters; a patent chaff cutter, and an improved chaff cutter, invented and manufactured by Richmond and Chandler; an iron sack cart, manufactured by the exhibiters; a cast iron stall trough, invented and manufactured by the exhibiters; a cast iron feeding pan, and a wrought iron oat bin, manufactured by the exhibiters; a galvanized iron sheep feeding trough, improved and manufactured by the exhibiters; a patent broadcast manure distributor (registered), invented by E. Fogden, of Eastdean, manufactured by the exhibiters; a broadcast sowing machine, invented and manufactured by E. Fogden, of Eastdean; and a crushing mill, invented and manufactured by Barrett, Exall, and Andrewa, of Reading.

WHITMEE and CHAPMAN, of 18, Fenchurch Buildings, City, 70, St. John Street, Clerkenwell, and 11, Ray Street, Clerkenwell, London.

(New implements) two steel roller corn crushers, (new imple-

ment) a corn crusher, (new implement) a steel flour mill, (new implement) a flour mill with French burr stones, (new implement) a flour mill to attach to power, and (new implement) a flour mill with horse power attached, all invented, improved, and manufactured by the exhibiters; and a kibbling mill, improved and manufactured by the exhibiters.

CHARLES D. YOUNG and Co., of 19, Great George-street, Westminster, Middlesex.

A reaping machine, invented by Mr. Hussey, of America, improved and manufactured by the exhibiters; a wrought and cast iron rick stand, 16 feet diameter, another 12 feet in diameter, invented, improved, and manufactured by the exhibiters; a specimen of iron hurdles, manufactured by the exhibiters; (new implements) two sizes of a patent anti-metallic churn, invented by P. R. Drummond, of Perth, improved and manufactured by the exhibiters; and a patent lever wrought and cast iron cheese press, improved and manufactured by the exhibiters.

ALEXANDER KENNEDY SMITH, C.E., of Commercial-road, Exeter, Devonshire.

(New implement) three sizes of a registered rotary screening machine, for screening ashes and other manures for drilling with turnips, wheat, &c., invented, improved, and manufactured by the exhibiter.

FENWICK DE PORQUET (under the name of Mary Wedlake and Co.), of 118, Fenchurch-street, City.

Two sizes of a chaff cutter, invented by the late Thomas Wedlake, of Fairkytes Works, Hornchurch, improved and manufactured by the exhibiter; a utilitarian or twin machine, invented by L. Fenwick de Porquet, of 11, Tavistock-street, Covent Garden, and manufactured by Mary Wedlake and Co., of 118, Fenchurch-street, City; an oat crusher, made of wood and iron, invented by Mary Wedlake, of Fairkytes Works, Hornchurch, improved and manufactured by the exhibiter; an oat crusher all of iron, for oats and beans, invented by Mary Wedlake, of Fenchurch-street, and manufactured by the exhibiter; an improved haymaking machine, invented by the late Thomas Wedlake, of Fairkytes Works, Hornchurch, improved by Mrs. Mary Wedlake, and manufactured by the exhibiter (obtained the silver medal at the meeting of the Royal Agricultural Society at Derby, 1843;) and a gorse or furze crushing machine for hand or horse power, invented and manufactured by the exhibiter, improved by Mr. J. Elliot, of Islington.

GEORGE CHIVAS, of Chester.

Specimens of the "new orange jelly" turnip, raised by the exhibiter, and specimens of 160 varieties of grasses in a green state, in flower, with the time of flowering and ripening, as well as the green and dry weight per acre attached to each.

CHARLES THOMAS, of Stratford-on-Avon, Warwickshire.

Three registered flexible hunting saddles, invented by Abraham Newland, of Stratford-on-Avon, improved and manufactured by the exhibiter; and a curb Pelham, invented and manufactured by the exhibiter.

GEORGE BRUCE, 52, Nelson-street, Liverpool.

A specimen of black japan varnish, a specimen of blue-coloured composition, a specimen of a red-coloured composition, a specimen of a green-coloured composition, a specimen of a stone-coloured composition, and a specimen of transparent varnish, all invented, improved, and manufactured by the exhibiter.

J. BAILEY DENTON, of 52, Parliament-street, London.

(New implement) a workman's draining level, called the A level, invented by the exhibiter, and manufactured Jones and Co., of 30, Holborn, London; (new implement) a foreman's draining level, called the improved A level, invented and improved by the exhibiter, and manufactured by Jones and Co., of 30, Holborn, London; a specimen of model mapping, for the drainage of land, with instruments for ascertaining heights and distances, and tables for computing the cost of drainage works, invented, improved, and manufactured by the exhibiter.

THOMAS MATHEWS HARE, of 3, Arundel-street, Strand, London.

A registered farmer's economic lamp, invented and manufactured by Tylor and Son, of Warwick-lane, London; (new implement) a registered portable fire or garden engine, invented and manufactured by William Baddeley, of 3, Arundel-street, Strand.

FREDERICK BELL and Co., of 7, Noble-street, London.

A ventilating waterproof cloth, invented, improved, and manufactured by the exhibiters.

ALEXANDER HETT, of 28, Bridge-street, Southwark, Surrey.

(New implement) a microscope, with a set of injected objects, invented and prepared by the exhibiter, microscope manufactured by Messrs Smith and Beck, of London.

TOMLIN and Co., of Kettering, Northamptonshire.

Sickles for reaping corn, improved by W. Tomlin, and manufactured by the exhibiters (awarded a prize medal at the Great Exhibition, 1851.

THOMAS GIBBS and Co., the Seedsmen to the Society, Corner of Half Moon-street, Piccadilly, London.

A collection of dried grasses, wheats, barleys, oats, &c., the seeds of the above, and a general collection of several hundred kinds of agricultural and other seeds.

CAPTAIN KÆMMERER, of Prussia (Agent, Ed. vom Hof, 43, Bedford-row.

A universal sowing, drilling, and dibbling machine, invented and manufactured by the exhibiter.

THE BENEFICIAL INVESTMENT OF CAPITAL IN LAND.

We have enumerated various modes in which capital may be safely and profitably employed in the improvement of land. They have reference chiefly to works which ought to be performed by the landlord, in order to place the land in a condition to receive the full benefit of the capital and skill of the tenant. Tenants, however, are frequently debarred from availing themselves of these improvements by the want of sufficient capital to turn them to account when the landlord has made them. Instead of having money to spare for the purpose of increasing returns, which can only be increased by a preliminary outlay, the majority of tenants have not capital sufficient for the ordinary cultivation of the land under the older and ruder, the less expensive but less profitable, systems to which they have been accustomed. To this cause may be traced no small portion of the opposition which improved processes experience. They are inconvenient, from requiring more capital than the farmer possesses; they are, therefore, voted theoretical, new fangled, and unprofitable. The man who cannot buy a thrashing machine will find a hundred excellent reasons for continuing to use the flail, though he could save ten shillings an acre in the cost of his wheat crop by abandoning it. He who cannot afford a drill will be a stout advocate for the superiority of broadcast crops. Are there no methods by which the present abundance of capital may be made available to the tenant-farmer? If a merchant or trader requires to extend his business beyond the limits of his own capital, he finds no difficulty, if in good credit, in obtaining

the necessary accommodation; and he employs this accommodation successfully, provided his transactions with borrowed money are confined within prudent bounds. It is not so with the farmer. We have heard this enumerated in the list of agricultural grievances—that while the commercial class can get bills discounted at 2½ per cent., farmers have difficulty in borrowing money at double that rate of interest. They forget that for such accommodation good credit is necessary, and that the agricultural body have damaged their credit by the cry of agricultural distress which has prevailed more or less for the last 35 years. They are in the position of a butcher of whom we heard his son say—"My father must have been a rich man once, for he has been buying sheep and bullocks for the last forty years and he says he loses by every one he buys." This butcher was a thriving man, and he could afford to be a grumbler; had he wanted to borrow money, he would not have grumbled. To declare ourselves insolvent, and our business incapable of yielding a profit, except under impossible conditions, is not the way to inspire confidence in an interest so sensitive as the moneyed interest. Independently, however, of this disadvantage under which farmers and landowners labour, which is of their own making, and which they alone can remove, there are others inherent in the very nature of farming. In commerce, money is returned twice, thrice, four times in the year, and even oftener. The trader who requires accommodation requires it only for a short period. He goes to his banker and deposits bills to be discounted. And with what funds does the banker afford the accommodation? With the deposits of his customers, a certain portion of which, it has been found by experience, may be so employed without danger of its being called for while placed beyond the banker's reach; and should an emergency arise, there are the bills on which the advances have been made, which can be re-discounted. The returns of the farmer, on the other hand, are for the most part made only once in the year—of some parts of his outlay he does not reap the full benefit for several years—and his business affords no such convertible securities, on which to raise money, as bills of exchange. Advances to a farmer, therefore, for the purpose of effecting tenant's improvements, partake too much of the nature of a "lock up" to find favour with bankers.

The same objection applies with greater force to landlord's improvements; but in their case it has in a great measure been removed by the Private Loan Drainage Act and the Private Acts of different Drainage Companies, under which the owners of settled estates are empowered to charge them with annuities for money expended in improving their value. Much, however, yet remains to be done. The more the legal cobwebs which have been woven round the transfer of land can be removed, the greater facilities will landowners find in availing themselves of the accumulated capital of other classes for effecting improvements which are equivalent to doubling and tripling the area of their estates. Can nothing, we repeat, be done to place within reach of the tenant-farmer some of that money which is at present a complete drug in the commercial world? Farmers require accommodation for longer periods than are consistent with prudence on the part of the lender in ordinary banking operations. They require banks of their own—agricultural banks—which shall only receive and employ money deposited as a permanent investment, or with the understanding that it would not be withdrawn for several years. It has been objected, that too great facilities for borrowing money are not advantageous to farmers. The case with which money could be obtained formerly of the paper issuing Local Banks, and lately of the Joint Stock Banking Companies, has led, it is said, many farmers to their ruin by tempting them to embark in hazardous speculation. Those speculations, however, were either foreign to the actual business of farming, and consisted in the purchase of corn or live stock to be held for a rise which never came, or they were railway transactions. On the other hand, if the loan had been invested in the improvement of their farms, the money had been lent them out of the deposits of ordinary banking, and was sunk in the land, where it was not convertible when the panic came, when the bank stopped payment, and its creditors pressed their claims on those who were indebted to it. There are means by which undue speculation may be checked, while every facility for borrowing money for the legitimate purposes of farming is secured to the farmer. There are means by which the present amount of farming capital may be doubled. Both methods have stood the test of long experience locally, and only require more general adoption. The consideration of them must be reserved for a future article. T.

THE ROYAL FORESTS!! SUGGESTIONS TOWARDS PROMOTING AN UNIFORM SYSTEM OF EXPERIMENTAL AND PRACTICAL FARMING.

BY A PRACTICAL FARMER.

We have for many years advocated the adoption of an uniform system of experimental farming, with the view of improving the agriculture of these kingdoms—we say an uniform system of experimental farming. By this we mean a system devised, arranged, and carried out, or effected, under one direction, board of directors, or order of management. We think this would be more beneficial, and a much more likely mode of arriving at a clear and accurate conclusion relative to any experiment to be tested, than if made by never so many individuals, however located, or however careful and intelligent they may be. We want to see an uniform system of agricultural experiments carried on under the superintendence of one head, or committee of direction; these experiments to be simultaneously commenced, continued, and systematically proceeded with in several parts of the

country, so as to bring all the tests of soil, climate, culture, and general management, to bear upon the particular subject or object of the experiments at one and the same time; the results to be carefully noted, in order that a full and accurate report may be given to the public. This much for experimental farming.

In practical farming we would adopt and test the great improvements brought into modern practice in all their varieties: in culture, in grazing, in grain, in pulse, in seeds, in vegetables, in grasses, &c.; also in the selection of cattle, in sheep, in pigs, &c., for fatting; in horses for sale or for work; in cattle for work, or cows for milking properties, &c. But we are anticipating; we will, therefore, proceed to give our suggestions. The Queen having most laudably placed all her royal forests at the disposal of the Commissioners of Woods and Forests for the benefit of the nation, we suggest that suitable portions of them be allotted, and be laid out in convenient farms in each district in which they are situated, and that they be cultivated upon a sound and good system of agriculture, combining the best principles of practical farming with a fair modicum of experimental farming. For this purpose, we would select suitable sites in the various forests, in accordance with our views. We have in the south the New Forest, in Hampshire; in the interior, Whitchwood Forest, in Oxfordshire; or Whittlewood and Salby Forests, in Northamptonshire; or again, a little further west, we have Deane Forest, Gloucestershire; again, eastward, we have Waltham or Epping Forest. We might, again, name the many farms in various parts of the country called Crown farms or Crown lands, which might, as occasion required or the leases fell in, be brought into requisition; so that we might have model or experimental farms in almost every district of the kingdom. We are not acquainted with the royal domains either of Scotland or Ireland; but the revenues from the Scotland estates are about £25,000, and of Ireland £60,000 annually; so that, if desirable, similar institutions may undoubtedly be established there. The farms should be *governmental*; the direction or management under the superintendence of the public agricultural societies—*i. e.*, of the Royal Agricultural Society of England, the Highland Society of Scotland, and the Royal Agricultural Society of Ireland, each in their respective countries. These respective societies to choose well-qualified individuals to take the practical management of the farms, to consist of one director for each country, and one bailiff for each farm. The directors and bailiffs to have a fixed income from Government, and a proportion or per-centage upon the annual profits of the farms under their respective direction; the directors a per-centage upon the whole. Agricultural schools might also be attached to some one or other of them, if desirable on the whole; or they might be made serviceable in educating agricultural engineers, bailiffs, and other very useful orders of workmen.

The council or committee of each society shall, through their chairman, communicate with the Commissioners of Woods and Forests, and arrange all preliminary proceedings relative to the apportionment of the land, the erection of buildings, and the disposition of management of the farms. They shall also be the medium through which the directory reports shall be transmitted, and proceeds of the farms shall be paid to the commissioners. From them shall emanate suggestions relative to the principal management, and directions as to the experiments to be tried and mode of trying them; indeed, from them all general orders and directions are to proceed, to be executed by the director.

The directors shall be entrusted with the sole management of the farms in their respective countries, under the committee or council, and in conjunction with the councils of the societies above-named to appoint a bailiff for each farm. The director shall be empowered (under proper securities) to draw upon the Commissioners of Woods and Forests for funds required to carry on the business of the farm. On him will devolve the keeping of the accounts as received from the bailiffs, the preparation of the annual report, and record of experiments and farm-practice for the information of the councils. The director should be a zealous, practical man, well versed in the science of agriculture, and without prejudice, as upon him so much will depend. The whole will be continually under his inspection, so that from his own observation, as also the reports of the bailiffs, he would give the account of every proceeding and the result.

The bailiffs' duties will be to act under the suggestions and carry out the orders of the directors, to superintend every practical operation going on upon the farms; to do their best to conduct every experiment fairly; to make full, accurate, and practical reports of every day's proceedings, and from these to condense a clear monthly report for the use of the directors; to pay the workmen and keep a clear debtor and creditor account of the proceeds of the farm, and as a check to the director; to attend assiduously to the management of the various live stock kept on their farms; their management in *fatting*, in *breeding*, or in *sickness*, the varieties of *food*, the *medicines* given; and the treatment adopted in each particular case, with their own remarks and notes upon the many and various cases, experiments, and proceedings, they are called upon to attend to, and carry out; so that the director may be able to present to the public a true and faithful record of the different modes of management pursued in respect to the various soils, crops, manures; the experiments instituted to test the relative values of various sorts of grain, of pulse, of seeds, grasses, vegetables; as also the fattening and other profitable qualities of cattle, sheep, pigs, poultry, &c., &c., &c., by which is to be shewn the cause of success or failure, either from soil or management, as also the adaptation of certain crops, of certain breeds of cattle, of sheep, of pigs, to locality, soil, climate, culture, or management.

We would further suggest that accommodation should be provided in the residence of each bailiff for a stated number of youths (as pupils), who shall take part in the duties of the farm, as also study the science of agriculture; such pupils to be nominated by the council or committee, and to be by them transferred from farm to

farm in such manner as may tend best to promote their education. Premium to be moderate, and an equitable portion thereof to be paid to the bailiffs for their maintenance. These youths to make a monthly report, or produce a journal of proceedings to the director on his periodical visit of superintendence.

Lectures on geology, chemistry, and scientific agriculture generally, to be provided from the balance of the reserved premium.

We propose that the great and vastly important modern practice of agriculture be carefully and fully tested; and, if possible, to make the improvement of whatever kind manifest to the public.

We propose that selections from the best varieties of grain, of pulse, of seeds, of vegetables, of grasses, &c., be grown upon these farms, under every kind of soil and varieties of manures when requisite, and the result accurately noted, in order to prove the peculiar adaptation of each variety to the *soil*, the *manure*, and the *climate* where grown, as also to the course of culture pursued.

We propose, further, that approved kinds of cattle, sheep, &c., be selected and grazed, in order to prove which is best adapted to the particular pasture and district in which they are grazed, as also the relative values of the kind of herbage upon which they are grazed, as grass, clover, lucerne, tares, or other artificial grasses. The whole to be carried out in such varied ways as are likely to lead to the most practical and beneficial results.

We further propose, that such kinds of cattle, sheep, and pigs, &c., be fatted in hovels, boxes, layers, or yards, upon the different varieties of vegetable and artificial food now in general use, and under such approved modes of management as may from time to time be thought desirable for experiments. This, to prove the relative value of each kind of food, and the most expeditious mode of fattening under every circumstance and condition of trial. *Instance*—The director purchases fifty head of cattle; he sends lots of ten each to five different farms to be fed in precisely the same manner; he purchases other 50 and distributes them in the same way, to be fed in five *different* courses, and under *different* circumstances; it may be one lot in hovels, one in boxes, one in byres, one in open yards, and one in sheltered yards; these to be supplied with *different* kinds of food, either singly or in lots, as appears most likely to prove the best mode of fattening, or best food for that purpose. Many are the modes that an intelligent superintendent or director would adopt to prove such relative values, and the result of course to be given to the public. The same with sheep and pigs. In this way, much might be learned as to what food has fatted fastest, what soil, and what culture has produced the best quality of food, and what treatment has been most advantageous to the animals under experiment. Added to this, much may also be gathered as to what varieties of turnips, mangolds, or other vegetables are suited to the different soils and districts under the order of management; the same with respect to grain, seeds, &c., &c.; so that such knowledge is widely and speedily diffused throughout the country, whereby any real improvement is promoted, and errors and mismanagement checked. The diffusion of practical information thus obtained by actual experiment accurately noted would guard the public against the introduction of erroneous practice either in the culture, crops, or applications of improper or useless manures. Upon the latter much depends, and much information is needed; we would, therefore, have this part of our plan attended to with the greatest care; as by the proper application and adaptation of artificial manures, our agriculture will ultimately be mainly sustained and perfected, the details of which we need not enter upon here. We would also have different courses of management pursued to prove their economy and adaptation to the crops and soil under cultivation; we would also attempt to prove the relative value of working cattle or horses, and of implements, and modes of using them; we would attempt to prove the relative value of appliances for drainage, irrigation, subsoiling, and methods of execution; nor would we exclude flax culture and management, or the growth of tobacco, chicory, &c.

In pursuance of this plan, we would have the whole course carried out in a steady business-like practical way, with the view of realizing the greatest possible profit; because, after all, the diffusion of knowledge would do but little to encourage a general adoption of the proposed measures unless a fair amount of profit can be shown, due allowance being made for failures which some of the experiments might cause.

We are confident that the fundamental grounds of this plan may be so judiciously and fully wrought out as to leave a good profit upon the farming department alone, and at the same time be the medium through which a vast amount of agricultural knowledge would be given to the world.

We are confident that a most satisfactory improvement in land revenue would be the result, and much employment of labour and increase of national wealth, independent of the great stimulus it will give to every department of British agriculture.

We are confident that our beloved Queen would most heartily rejoice in the knowledge that her munificent gift was thus made the means of elevating a most depressed agriculture, and in contributing so essentially in promoting the happiness and prosperity of that portion of her subjects, "The British Yeomanry."

TREES SUITABLE FOR PLANTING IN PUBLIC WALKS AND PROMENADES.—The tree most commonly used for planting in public walks is the Elm (Ulmus campestris). It will grow in almost any soil, but prefers a light to an argillaceous one. The Lime (Tilia latifolia) is also much employed. It has a very graceful form, and bears pruning well. But there is an objection to its use in the shortness of the time its foliage retains its beauty, which is only from the end of April to the middle of June; and as, after this time, its leaves are continually falling, it occasions much labour to keep the ground in its neighbourhood

however, be greatly diminished by employing Tilia sylvestris instead of T. latifolia. The Pyramidal Poplar (Populus fastigiata), on account of its form, and the height it attains, is often planted. It is said to impoverish the soil for a considerable distance, as its roots are principally superficial; but this would scarcely be felt as an inconvenience in towns. One of the most beautiful of the trees commonly planted is the Acacia (Robinia pseud-Acacia); but it is so liable to injury from the wind, on account of the dry nature of its wood, that it is not desirable. The Robinia inermis is less objectionable. The Sycamore and Maple (Acer Psendo-Platanus and A. Platanoides) are valuable on account of their hardiness and ready adaptation to any kind of soil, but are very liable to be attacked by insects. Left to themselves, they soon become unsightly, and do not well sustain pruning. The Common Horse-Chestnut is, with good reason, a favourite tree. When its fine clean. This inconvenience, as well as the former, might, and numerous flowers expand upon its beautiful foliage in the vernal season, it seems to chase away winter, and bring back spring with her flowery train. It dislikes a damp or compact soil, but grows freely in that which is of a light and dry character, and bears pruning well. There is no tree which, for its vigour, its hardiness, and its beauty, deserves more consideration than the Ailanthus glandulosa. It grows extremely fast, and very straight; and its wood, which is of a fine grain, is useful for many purposes. Added to this, it is by no means particular about soil. Another tree which claims our particular notice is the White Poplar (Populus alba). To the advantages of elegant form, beautiful foliage, and rapid growth, it joins that of never being attacked by insects. The three things to be kept in view in planting trees for promenades are, their adaptation to the soil, their capability to sustain pruning, and the arrangement of them in such an order as that those species only may be together which expand and shed their leaves at or about the same time. —*Revue Horticole.*

THE TIPTREE-HALL GATHERING.

(FROM A CORRESPONDENT.)

Mr. Mechi is at length occupying his proper position in the agricultural world. And it must be the better for all parties, pleasanter for himself and fairer for his contemporaries the longer he continues in that rank which he now appears willing to fall into. The Sir Oracle of a few years since gradually softens into the enthusiastic experimentalist, the heaven-born dictator into the striving student. The common course of things would generally lead us to reverse this career, but from the days of Phaeton there have been many apt to go a little too fast at starting, and to arrogate at once a lead ere experience had qualified them for the direction they assumed to.

We could wish Mr. Mechi, for a short season at any rate, had been content to watch and follow; or that from the first his experiments and his deductions had been offered in that spirit we are now ready to receive them. We are quite certain, had this been the case, that his popularity and success with that interest for which he professes so much, would have been far greater and far more satisfactory than we fear it now is. What is more too, and still more to be regretted, his labours, insomuch as they are beneficial, are yet comparatively ineffective. The practical tenant farmer, the working man of the audience, to whom of all others you must come for the test, has grown weary of a lecturer who has said so much and proved so little. Of one, be it remembered, who commenced by assuring his auditory that they knew nothing and he everything; that they were fast asleep, but he himself wide awake; and that where they might make a living, he would make a fortune.

To use a common expression, "it took the breath away" from men who had been years following, and who perhaps fancied they understood something of their own business. They saw before them a gentleman who had already proved himself singularly successful in that pursuit he had devoted himself to, boldly declaring that he was going to do as much again with theirs. They heard him reiterate his intentions and operations as a simple matter of business—of pounds, shillings, and pence—of return for outlay, and clear profit on the proceeding. His was to be no theory, no playing at farming, no wealthy citizen's amusement, but a downright good thriving trade. This was the way; he could and would show it, and the farmers who did not at once follow him wanted, of course, spirit, capital, science, sense, and so on. Landlords took it up, they could hardly well avoid it with so much looming in the future; and so sent their tenants to Mr. Mechi, or brought Mr. Mechi to their tenants.

We all know how this has ended; we all know how that much-abused, apathetic individual, the tenant-farmer, craved and clamoured for the balance of this simple matter of business; and we all know now how to look on the Tip-tree Hall operations. Mr. Mechi knows it too; and the American minister truly summed it up in one of his excellency's well-balanced, high-sounding sentences; as "it not being for us to ask the profit or loss upon all this." On this very understanding the majority of a numerous attendance must have reached Tiptree on Wednesday last. Ready to be pleased with the energy and good intentions of "an amiable enthusiast," as another distinguished visitor styled his host, rather than to examine too closely into the effect of what was attempted. We can only repeat our regret that this understanding had not been sooner arrived at, and that Mr. Mechi had not been sooner placed in that position as an agriculturist which alone he is yet qualified to occupy. As it is, the farmers of this country may not now give the attention to some of his undertakings

and experiments which they in reality deserve. The fault here, however, has been his own, not theirs ; and the comparatively small number of them, amongst the many other classes assembled round his hospitable table on Wednesday last, strengthens us in this opinion. Year by year they give place to other names and faces less familiar to us, until at length we begin to fancy it will be a Society of Arts, and not a Society of Agriculture, that will be called upon to pronounce as to the good or evil accomplished on Tiptree Heath.

The business of the day commenced, as usual, with a round of inspection, and a halt every now and then to hear some peculiar system explained. Thorough drainage, thin-sowing, hedge-row removals, and other things acting on the crops examined, were, of course, in the catalogue of the active, good-humoured showman's specifics. Still, they only came in for secondary consideration. There was a new topic, a new panacea, just at present the pet project, that entirely eclipsed all others. Wherever you went, it was with odour of liquid manure ; whatever you saw had some reference to liquid manure ; whatever was done well, was done with liquid manure. The pipes lay about the fields in profusion ; and ever and anon a highly-charged shower was played off, for the equal benefit of the visitor and the proprietor. The wheats, generally good, and here and there very even, owned to some taste of it ; the swedes and mangold confessed, though not so openly, its refreshing influence ; while the clover, and cabbage more especially, flourished under the favour of Mr. Mechi's recent applications. But it did not end here. Again in the banquet-room was there a free entrance and ready hearing for so all-absorbing a topic. A metropolitan sanitary deputation was there to support it with their presence ; and Lord Ebrington, taking his cue from another noble lord at Lewes, tired even the London reporters in his praises of it. Mr. Chadwick again echoed these praises at nearly equal length ; and Mr. Mechi himself, of course, had the liquid manure as a chief point in his own speech. Beyond this one toast of "Sanitary Reform," proposed and replied to as just mentioned, the toast list requires but little comment. The American Minister replied to "Agriculture—British and Foreign," proposed by a gentleman—one of the rejected of Essex, we believe—who had the unhappy taste to introduce political topics into his address, but which the meeting with more breeding suffered to pass unnoticed. Mr. Raymond Barker then responded to "The Royal Agricultural Society," proposed by Sir James Duke. Lord Fortescue gave "The Chairman" ; and Mr. White, another American, closed the evening's entertainments with a genuine Yankee oration.

It will be observed that on this occasion no practical farmer was called on to give his opinion of the day's proceedings. We can remember meetings at Tiptree when it was otherwise ; and we fear the value of these gatherings can only suffer from the want of such an estimate. In the field, such as were present had more opportunity—not only of canvassing the merits of the crops, but, as is customary, in the trial of some implements of agriculture. The great feature amongst the latter was again the reaping machines, the result only further confirming the superiority of Hussey's, that is as now matured under the auspices of Messrs. Garrett. It worked both with wheat and clover most admirably ; and no implement introduced into the operations of the farm promises to make its way with less prejudice or opposition.

In concluding this notice, we will add—though it perhaps may be scarcely necessary—that we write in the fullest spirit of fair-play. We thank Mr. Mechi heartily for his hospitality ; we admire equally with any one his enthusiasm and activity ; and we admit readily the advantage some of his experiments—this of liquid manure for one—may afford in the cultivation of the country. On the other hand, we can look on him only as an enthusiast and experimentalist, and not as that heaven-born authority some theorists, and theorists only, would wish to proclaim him. In considering his works and visiting his place, the *bonâ fide* farmer must act as Mr. Lawrence says America does towards England—"merely copy that which suits his condition."

THE POTATO DISEASE.

There seem to be again some symptoms tending to show that the potato disease is renewing the unmistakeable indications it before manifested when we had more or less partial and general destruction of the crop. Not that we by any means expect a visitation at all equal to "the year" of the potato rot ; but there are indications that we are not yet at least free from its ravages. Some of the early kinds in several counties have exhibited symptoms of the disease—the peculiar brown decay under the semi-transparent cuticle ; and the same form of disease has, we fear, attacked the winter beans in several localities.

Now all experiments on the potato disease up to the present moment have hardly established one single fact tending to a settlement either of its cause or its cure. The facts are these. The disease usually attacks the potato in its stage nearest maturity. In the case of hot-house plants it occurs in May and in June, in the early exposed kinds it frequently is delayed till July, and in the ordinary kinds it is August before any serious extent of damage is done. It commences, as a rule, in the south first, in the north last. Sometimes it occurs in spots on the stems, and sometimes on the leaves, as if sulphuric acid had dropped from the clouds ; but it occasionally attacks the tubers first, and not unfrequently so thoroughly infects a single field as

to sweep over the whole as if it had been blackened by an October frost. This has usually occurred in the north in the middle of August, and was always accompanied by a peculiar misty suffocating vapour, not frosty, but rather hot, and in three days the whole breadth of the potato district was one mass of putrefaction. The celebrated Irish potato commission which was appointed by the late Sir Robert Peel, is only a monument of the impotence of scientific research, and was one of the unfortunate steps of that prime minister which ended in a farce and an abortion. They discovered nothing, they taught nothing, and their recommendations were remarkably worthless. It required a year or two to register facts. There were wonder-escapes. We carefully noted the whole. We found that under the influence of the sea they often escaped. We found that in soils of the magnesian limestone they did the same; and we found that on peaty soils they sometimes resisted the influence, be it what it might. Now we imitated these. Sea influences we could not have, but we salted the land with a considerable dose of salt; we had not a soil of magnesian limestone, but we gave it a considerable dose of that material; and we selected a peat soil whereon to try the experiment. We staved off, we fancied, the disease: the crops were taken up whole, but they diseased sadly afterwards. And this is a phase which the disease is now assuming, even when a visitation in the field is entirely escaped. We have, for instance, had in several years to sort and sort and dry in open sheds for several weeks; and we have found so many bad in the spring that we have had to open the pits long before the time they were required for use, in order to save a few from utter destruction. Our plants in the autumn of 1851 were free from the appearance of taint: our tubers were entirely free from disease: they were carefully dried and sorted. But the work began; and five-sixths of the whole went off before Christmas.

Now, whatever may be the cause of the disease, whether electrical condition, ammoniacal vapour, acid accumulations, or whatever else, it is clear we have so far no remedy. Elaborate efforts have been made to show the disease to be a fungus, and so it certainly developes itself, before it has been long in possession of the plant; but the fungus adheres to a *diseased* plant, and is only a secondary symptom. Nor can it be the aphis of Mr. Smee, when potatoes sound at taking-up time—in October and in November—become diseased and die in December, and this not from contact nor heating, but from some diseased tendency either organic or atmospheric.

Observing the tendency to disease in December, we determined to try the antiseptic power of the Irish peat charcoal. On the 19th of December we selected three lots of potatoes which we will for clearness designate by the numbers:

No. 1. Consisted of potatoes infected with disease.
No. 2. Do. very slightly tainted.
No. 3. Do. quite free from disease.

One half of each lot was taken out and immersed in peat charcoal, the rest preserved, each lot separately, and all in the same circumstances. On the 19th of June they were all taken out; and the following was the result

	IN PEAT CHARCOAL.	WITHOUT CHARCOAL.
No. 1. (Quite diseased)	All dead.	All dead.
No. . (Slightly diseased)	One-fifth dead; one-fifth slightly affected; all the rest sound.	One-fifth dead; all the rest sound.
No. 3. (Free from disease)	Free from disease.	Free from disease.

Now, to say the least, we have this negative evidence—that as far as arresting the progress of the disease, or curing, it in potatoes tending to disease after being raised, so far as these experiments go, it has no advantages whatever.

The experiments are of some value at least in tending to establish this negative evidence; and they go further, and tend at least to oppose the notion indulged in by some, that the disease arises from ammoniacal vapour. For so great is the antiseptic power of the charcoal that there seems to be some difficulty in imagining how a merely ammoniacal state of the atmosphere could in any way affect potatoes immersed in the dry charcoal.

We have no doubt several parties will try the planting of potatoes in drills in which peat charcoal has been used, but we must say we see no great chance of the application being very beneficial, nor can we say what will stay its progress.

Of the bean disease we know even less. It is a plant most subject to climatic influences, and a most difficult one to cultivate under any circumstances. But the winter bean has hitherto resisted the "dolphin" and the "weevil" so fatal to the spring bean, and now to have it diseased is a new feature in bean cultivation.

As an experiment we would advise the tops all at once to be cut off with a sickle the moment the disease makes its appearance, and a dusting of quick lime might be tried. We would also advise our readers to watch their spring-sown beans, to detect the first appearance of the invader, for the mere fact of its being free will by no means prove that it will never be attacked; and it is most likely that when the spring beans attain the same degree of maturity, they will suffer in the localities where winter beans are attacked. — Gardeners' and Farmers' Journal.

AGRICULTURAL CALCULATIONS.

Sir,—There can be little doubt that a few years ago, if a writer wished to illustrate the inherent power of soils and climates, and the adaptation of some to the production of special objects, he would have chosen sugar for his text. Nothing could well exceed the contempt with which the first efforts of the French to extract sugar from beet were regarded by the supercilious theorists of this country. A clear insight into the physiology of plants, as well as into the working of the gases, first explained by Lavoisier, has now changed the relative position of the beet and cane for the production of sugar, and each comes before the calculating producer on the ground of its real merit; that is to say, what amount of capital is required to make either successful over its rival.

People easily forget the stages of mind through which improvements pass before they are fully adopted. It will therefore soon appear odd to many clever men to be told that there was a time when it was scientifically demonstrated that competition with the West India planter, in sugar producing, was not a matter of capital. We happen, however, within a few weeks to have seen a pamphlet from the pen of a late but ardent worshipper of soils, Professor Hancock, of Dublin, whose work written in the sense of the school of which he is a disciple, was calculated to retard the introduction of the sugar-beet cultivation in these islands. The pamphlet in question is a melancholy record of the disposition of men to follow up views that they must feel are erroneous, in the confidence that their position will screen them from exposure. In this case the result was a different one. The name of a French manufacturer of eminence was used by Professor Hancock. Calculations were put forward as coming from M. Hamoir of Valenciennes, which excited well founded suspicions on the part of Mr. Digby Seymour, of the Inner Temple, whose attention had been drawn to the subject of beet-root sugar. In reply to a letter from Mr. Seymour, M. Hamoir sent an unqualified contradiction to calculations which he denied all knowledge of, and which it excited some disgust to see coupled with his name. He also sent figures of a very different kind from these, which M. Hancock had had published under his name, and it becomes necessary, in order to leave no doubt on the farmer's mind regarding this very interesting crop, to reproduce the figures and the contradiction of Mr. Hamoir, from Mr. Digby Seymour's interesting pamphlet, here. For, although Professor Hancock, in the latest publication of his views, thought proper to quote from this pamphlet, yet he very unfairly extracted neither the disavowal of M. Hamoir of his whole statement, nor the corrected figures supplied from the experience of the French factory.*

Professor Hancock, as the nominee and representative of the Archbishop of Dublin (whose views of political economy he faithfully transmits), is in too important a position not to be exposed to criticism. It is as much on that account that his work is here specially introduced, as because it affords an excellent warning on the subject of agricultural calculations in general. The difference between Professor Hancock's estimate of the probable yield of beet in sugar, and that given by Mr. Digby Seymour, as founded on the correction of M. Hamoir, amounts to no less than from *a heavy loss* to a *profit of* 100 *per cent.* To results so widely asunder will a selection of factors in the formula offered to calculators lead! The two calculations for the manufacturer's prospects are the following:—

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* We deem Mr. P. Hamoir's letter important enough to insert it (translated) at length:—

(Translation.)

Valenciennes, 1st Oct., 1851.

Sir,—I have duly received your letter of 22nd ultimo, to which I regret not having been able to reply sooner, and beg you will excuse me.

I have no knowledge, whatever, of the pamphlet published by Dr. Hancock, and beg you will procure it for me, that I may learn what it contains relative to statements put forward as mine by that gentleman. I must acknowledge my surprise on this head, since I do not remember that, during my stay in Ireland for the purpose of studying the economical side of the introduction of the beet sugar manufacture into Ireland, I ever had the smallest communication with Dr. Hancock. During my stay at Dublin I frequently saw Dr. O'Sullivan, to whom I communicated some very important information on the subject.

* * * * * *

If my business should call me to London, I will do myself the pleasure of calling on you. At present I confine myself to answering the questions, and trust that will suffice.

1. The price of beet-root varies in different parts of France; in the north it remains steady, at 18 francs the 1,000 kilos. or ton.

2. The yield of the land varies also in different localities. In our neighbourhood it is 40,000 to 45,000 kilos. per hectare (16 to 18 tons per acre). This is considered a large crop, and many manufacturers obtain much less, while very few exceed it.

3. The cost of manufacture of the sugar per ton is also variable according to the system followed; but it is generally presumed to be about 12 to 15 francs per ton. The yield in sugar is, with good work, on the old principle, 6 per cent., of the quality of that shown at the Exhibition: on our system *we obtain 7 per cent.*

I have already said that I have studied this matter in relation both to England and Ireland, and believe I can assure you that sugar-making will offer good results to both these countries—not that I have any great faith in the efforts now making in that quarter, because I do not see any man of sufficient knowledge at the head able to bring them to a good result. This is a very unfortunate circumstance, for it is to be feared that it will mislead people greatly as to the chances of success, and will prevent other and better-judged attempts. The society to which I belong in France would most willingly have co-operated on a large scale; because (I repeat it) I have faith in the matter itself. We should, however, in any case, follow the dictates of our long experience, which I have often been surprised to see thought lightly of by different people to whom it was communicated. I hope I have met your wishes by replying in this manner, taking, as I do, the greatest interest in the experiments made in Ireland, and shall be glad of any information respecting them.—I have the honour to be, sir, yours, &c., Paul Hamoir.

To Mr. W. D. Seymour,
2, Inner Temple Lane, London.

Dr. Hancock's	£.	s.	d.	Mr. Seymour's.	£.	s.	d.
61,607 tons of beet at 15s. 6d. per ton.....	46,080	0	0	61,607 tons of beet at 10s. per ton.....	30,803	10	0
Cost of manufacture at 15s. per ton.....	39,900	0	0	Cost of manufacture at 11s. per ton.....	33,883	17	0
	85,980	0	0		64,687	7	0
Produce of 4½ per cent. of sugar at 28s. per cwt.....	81,430	0	0	Produce of 7 per cent. of sugar at 28s. per cwt.....	136,767	10	9
Loss	£4,550	0	0	Profit..	£72,080	3	9

Now it must be clear that the difference in these two conflicting estimates turns upon the capital and its application; first to the soil, by which the greatest weight of beet and the richest root is produced; and next to the manufacture, in order to produce 7 per cent., or more, instead of 4½ per cent. This last figure Professor Hancock should not have printed after reading Mr. P. Hamoir's letter.

Our main object in going into these details is to shew how the influence of capital is traceable on all soils and in all climates.

But we must remind the reader that capital is by no means a convertible term with money, it comprises, as before said, knowledge, skill, and freedom from prejudices. In many cases a large capital is thrown away from ignorance of the value of refuse, which nobody would buy, and yet which could not be bought in the ordinary way at market. The cultivation of beet depends above all things on knowledge.

Skill in the choice of manures is the most essential thing. Various chemical salts are injurious to the formation of the sugar in the root. Nitrate of potash is most damaging in this respect. To manure the soil with substances which contain the elements of sugar is the great point: the farmer in Germany, therefore, who applies his liquid manure—which he imagines is an universal remedy for sterility—to beet, undoubtedly will get a heavier weight of root; but he will find the juice yield less saccharine matter than it would with a better chosen manure.

Lime which assimilates with carbon, whether in the shape of the mineral or as mineral charcoal, is the best immediate manure; and when mixed with the fibrous matter and albumen which remain in the refuse after the sugar is extracted from the root, offers nearly all the component parts of the beet-root. The carbon required to complete the plant, is assimilated from the moisture contained in the soil, or from the carbonic acid gas imbibed by the leaves.

From this short explanation, it must be clear that the new process adopted at Valenciennes and Waghaüsel, of which it is clear that Professor Hancock was most innocently ignorant, gives the beet-growing farmer a manure which he could get by no stock-feeding. By the improved process the root, after being cut up into pieces, is thrown into air-tight cylinders, and well mixed with quick-lime. Steam is passed through these cylinders, and, under the pressure of an air-pump, extracts, far more effectually than the hydraulic press used at Mount Mellick, the juice from the root. This juice is then immediately heated for the extraction of the sugar; the refuse left in the cylinder contains, however, all the elements above-described, as essential to the formation of the sugar beet-root. It ought, therefore, after allowing a little fermentation to render the decomposition active, to be put to land in which beet is next to be grown. The nitrogenous manures, guano, stable-dung, &c., and the free alkalies, ought to be taken out of the soil by crops of grain and of flax, leaving the third year for the beet. In this manner we can account scientifically for the largest and most profitable yield that any soil can produce. The part which water plays in the formation of the carbon is plain, and since this must to a great extent be absorbed by the small fibres of the root, it is evident that a moist climate suits the production of sugar *in roots;* hence England and Ireland are, by nature, beet-growing countries. Where the carbon has to be assimilated altogether *through the leaf*, nature has provided a bulky, wide-spreading plant like the cane, the palm, or the sugar-maple. We shall next examine the relative claims of all these plants, with the demands which each makes upon the soil and on the capitalist.

I have the honour to be, Sir, yours, &c., B.

AMERICAN REAPING MACHINES.—HARVESTERS.

Under this division, 15 patents have been granted. For the last two years much attention has been given to this class of agricultural machines. At first, they were confined to the cutting of grain chiefly, then to grain and grass, and now they have been extended to almost every herbaceous growth of the soil. Thus we have grain and grass harvesters, corn harvesters, corn-stalk harvesters, cotten harvesters, cotton-stalk harvesters, clover-head harvesters, hemp harvesters, &c. I shall notice several of these, as they present something of interest to prairie farmers especially. The first machine that I shall mention in this class, is a machine to harvest cotton-stalks in the fields. It is a machine having two horizontal shafts, running from side to side. The upper and forward one has radial knives or beaters, which rotate rapidly, and beat down the stalks, while the rear shaft is supplied with radial longitudinal knife-edges extending from side to side; and as the blades come down, they chop the stalks in pieces. The second machine noticed under this division, is a grain and grass harvester, presenting two principal points of invention. First, the cutters, which consist of two horizontal saw blades, lying flat upon each other, with the teeth looking forwards, and vibrating upon each other as the face of the saws is pushed forward against the standing grass. The peculiarity of these teeth consists in their being made concave on their inner faces, so that when they slide past each other, they cut somewhat on the scissors principle, and are, to some extent, self-sharpening.

Second, there are what are called cyma-reversa fingers, working in combination with certain rake-teeth, designed to hold the charge while the fingers take it, and deposit it on the ground. The third machine of this division is a corn-stalk harvester, the frame of which resembles a low three-wheeled truck, and bearing upon its upper surface, near its middle part, two broad metallic discs, armed with teeth on their peripheries which teeth slightly overlap each other, and are capable of seizing and holding within their grasp any herbaceous matter, and, as the machine moves forward, to tear it up by the roots. The meeting of these teeth is near the central part of the machine, anterior to which the space is perfectly clear, so that when the machine is driven over a row of the corn-stalks, the latter are successively brought against the teeth of the metallic discs, and drawn out of, and deposited upon the ground. The fourth machine is an ingenious contrivance for distributing the cut grain of a harvester into suitable parcels for bundles, by the weight of the grain. It is called a grain binder. It consists of a self-regulating rotary cylinder, mounted on the rear end or extreme right side of the machine, and having its axle parallel with the rear end of the machine. This cylinder is supplied with catches and springs, and so arranged that when a certain weight of grain is received into one of its three compartments, it performs a third part of the revolution, and deposits the amount received for a bundle, while the next compartment of the cylinder is being charged for a second bundle, and so on. One patent has been granted for a machine to harvest hemp, a prominent peculiarity of which consists in the method of severing the stalk, by means of an oblique chop stroke of the cutters falling obliquely across the spaces between the fingers, and upon the edge of the finger on the further extremity of the finger space; the oblique stroke being given by the shaft on which all the cutters are arranged, which shaft is semi-rotated in screw-thread bearings, so that the shaft in so rotating and re-rotating as to raise and depress the cutters, should, in performing this operation, give the oblique motion which severs the stalk, as set forth. Two machines, adapted to harvest maize, have been patented. The first of these contains a thresher to husk and shell the grain. The harvester consists of a machine, in its general arrangement, not unlike a clover-head harvester. But it has a series of pairs of rollers, one pair between every pair of teeth, to seize the stalks and pull them downwards, until the ear is drawn against the tops of the fingers, by which the ear is severed from the stalk. The ear then rolls down an incline plane to the thresher. *A second machine for harvesting maize or grain* has also been patented. The gist of this invention consists in the construction of the grain reel, made with rows of fingers, projecting radially, and rotating over or through the standing grain. The stalks being received between the fingers, the ears are pulled off and deposited on an inclined endless apron. *A grass harvester* of a novel construction has been patented, which it will be difficult to describe without the aid of drawings. Some idea of its general character, however, may be formed, by supposing a flat washer-like ring of metal to be cut out of a sheet of metal, and placing it in a horizontal position. Now place upon its surface, symmetrically, a series of sharp razor blades, a few inches apart, having the shank confined to the ring by a screw or rivet, and the ends of the blades projecting beyond the periphery of the ring. If now the ring be rotated, so that the cutting faces of the blades be forward, and in this state be brought against the standing grass, it is contended by the inventor that the machine will be a successful instrument The cutting-blades are supported in their position by suitable contrivances, and the ring with its cutters has also suitable devices for supporting it, and rotating it as the carriage moves forward, which it is unnecessary to refer to here. *Horse Rakes.*—Only one apparatus under this division is regarded worthy of special notice, although six patents have been granted. This invention is denominated a machine for binding grain. The frame of it resembles the platform of an ordinary harvester, so constructed that the curved rake-teeth, projecting upward through the floor, and passing across the same from side to side, collect the grain at the opposite side where it is brought against a curved arm, between which arm and teeth the grain is pressed; and at the same moment another curved figure rises through the floor from behind, to support that half of the bundle, while at the same time the curved rake-teeth, by means of the machinery, fall backward through the floor, and are carried back to the opposite side of the platform, or to the starting-place, for a new charge. The only duty required of the attendant with the machine is, to tie the band for each bundle or sheaf.—*From the American Patent-office Report for* 1850-51, *in the Mechanic's Magazine for Jan.*, 1852.

GRAND MEETING OF THE PRUSSIAN GENERAL ASSOCIATION FOR THE ADVANCEMENT OF AGRICULTURE,

AND RE-UNION OF THE FOUR AGRICULTURAL SOCIETIES FOR THE PROVINCE OF PRUSSIA, AT KONIGSBERG.

(FROM OUR OWN CORRESPONDENT.)

The revolution of 1848, and the years of agricultural and commercial derangement that preceded and succeeded it, had entirely prevented, for many years, the usual annual meeting of the Prussian Agricultural Society. Several attempts were made by the central committee, but a complete failure was the issue. The improved state of the country during the past year, however, caused them once more to renew their efforts early this spring; and these were responded to so warmly by numerous estate-proprietors and stock-owners, that the present grand meeting is the result. Circulars were addressed to all the principal landed proprietors; the committees of the four provincial societies were organized; sub-committees formed, and the whole proceedings were placed in train; and Konigsberg was fixed on as the city for the re-opening exhibition. At length, on the 15th ult., the general committee, having fixed its head-quarters at the Hôtel du Nord, issued a programme of arrangements. The four united societies are—1, The Chief Society of West Prussian Agriculturists at Marienwerder; 2, Agricultural Central Society at Danzig; and 3, 4, Agricultural Central Society for Lithuania at Gumbumen, and for East Prussia at Konigsberg. The association has four objects:—The free competition of all breeders, inventors, and agri-

culturists, with their cattle, machines, and productions; the exhibition of specimens of all races of cattle breeding of the province; the show and prizing of mares belonging to labourers; the trial of agricultural implements and machines by practical application. For the promotion of these purposes, prizes of medals, money, and other honorary rewards, will be distributed; and the funds arise from—1,000 thalers voted by the Ministry for Agricultural Affairs; the State's funds, 850 thalers for labourers' prizes; 2,500 thalers, to be raised by the sale of 5,000 lottery shares, for the purchase of exhibited articles as prizes; 1,000 thalers, being the contribution of 250 thalers from each of the provincial societies; and the funds arising from the sale of tickets and admission to the cattle-show. The chief president of the association is general councillor of the Chamber of Agriculture, Herr Jachmann; general secretary, Herr Küder.

FIRST DAY (Wednesday).

Though the meeting was nominally to commence to-morrow, yet it may virtually be said to have opened to-day with the trial of ploughing implements; indeed, the whole city has presented such an appearance of festivity that we may be excused for anticipating the actual beginning. During the past week the note of preparation has busily sounded. The committee has sat daily at the Hôtel du Nord, for the transaction of general business, as well as sub-committees of arrangements, information, reception, &c. As it was anticipated that, in consequence of the number of visitors, all the hotels would be overcrowded, a lodging committee was formed to receive addresses, so as to provide visitors with comfortable apartments, stables, and other accommodation. A very reasonable price of admission to the cattle show (5 sgr.), and subscription to the society (1 thaler, admitting to all the meetings &c.), was also resolved on; and it was likewise decided to found a lottery, with about 500 prizes of every description, from a horse, value 60 Friedrichsd'or, to pots of flowers worth 10 silbergroschen: the holders of these tickets (15 sgr. each share) to be admitted to the various shows, but not to the sectional or general meetings, or excursions, which are only open to the subscribers of 1 thaler and upwards.

Königs-Garten had been selected by the committee (and granted by the city authorities) as the place of exhibition. It is a large open square in the centre of the town, used as the parade ground, and where Kiss's grand bronze statue of the late king was last year inaugurated by his present Majesty. During the week this spot has been the scene of great bustle and activity. A great number of workmen have been employed preparing the divisions for the different classes of cattle, &c.; for sheep (the great production of the province), a very extensive covered pavilion has been prepared on the south of the square. The large exercise-house has been arranged and divided for the reception of machines, implements, and agricultural productions; and the arrangement of these is nearly completed. The Horticultural Society of Konigsberg has undertaken the decoration of the entire ground; and a mass of gardeners and labourers are busily preparing garlands, flowers of every description, floral trophies, gigantic bouquets, &c. Not only the neighbourhood of Königs-Garten, but the whole city looked more as if adorned for the reception of some sovereign potentate, or for the celebration of some civic festival.

The proprietors of the various public gardens are using all efforts to render these places of resort as attractive as possible, by concerts and other amusements. The director of the theatre is also not behind-hand; and the usual opera, ballet, and dramatic company, is aided by the performance of the well-known Flora Fabbri, the *danseuse*, who is starring here.

The judges of stock, machines, productions, &c., are the estate-proprietors—Herren Douglas, Kleist, Papendiek, Fritze, Ostendorff, Heinfurt, and Minden. The general committee and commission is very large, including many members of the agricultural nobility; and from these the officers of the different sections are selected. According to the programme, the number of papers and subjects to be read and discussed before the general and sectional meeting is 38; on the following subjects:—How is the necessary capital for agricultural improvements to be made accessible? On land-drainage: How is the necessary (but at present deficient) country police-force to be maintained? On farm-labour: On the best means for the proper representation of the agricultural interests: Respecting the continuation or abolition of the Sound duties, and their effect on agriculture: On the duties on iron: Alteration of the cabinet order of June 11, 1825, respecting the free delivery of stones for the formation of Macadamised roads: Discussions on ploughing machines: The cultivation of the carrot: Of maize: Artificial manures—Guano, bone-dust, oil-cakes: Threshing machines: Cultivation of lucerne: Discussions—In what way is the new railway connection of most advantage to the farmers of the province, with respect to animal production? *Is it advisable to establish a fat cattle market* in the province? Whether in the country breeding-studs, by the breeding and selection of stallions, it is advisable under present circumstances to pay particular attention to the breeding of working horses?: On the potato cultivation: Distilling applications: Cultivation of the beet-root: On fruit trees: On flax cultivation: And various other subjects connected with agriculture, and agricultural improvements.

The weather is very propitious: the sale of subscription tickets has been extensive, and nearly all the lottery shares are sold. The list of arrivals of the higher nobility and gentry, who have announced themselves at the bureau, is extremely large, amongst the names. (many of whom are well-known to English Agriculturists,) may be mentioned—Herren Von Simpson-Georgenburg, Von Simpson-Wensöwen, Von Stutterheim, Government President (retired), Von Salzwedel; Baron Von Hoverbeck, Colonel Von Stutterheim, Baron Stromberg, Herr Von Below-Lugowen, Lieut.-Gen. Baron Von Krafft, Stud-Inspector Rost, Herr Von Knoblauch-Pilwen, Graf Klinckowström of Hohenfelde, Graf Klinckowström of Korklack, Graf Von Schlieben of Sanditten, Professor Volkmann, Baron Brederlow; Herren Von Sauden, Von Janson, Von Schön-Dirschkeim, Von Schön-Daniellen, Von Putthammer, Von Kries; Councillor Schirrmeister, Baron Von Bahl, Councillor Baron Von Buddenbrock, Major Von Bronsart; Herren Von Saucken-Tarputschen, Schlenther; Councillors Von Gottberg, and Von Heyden; Herren Von Tyszka, Von Heiligenstädt, Von Marquadt, Von Kalksteim, Von Neumann, Von Glasow, Von Weiss, Estate-Inspector Von Graszhoff, Inspector Messerschmidt, and about 200 others of the land owners from all other parts of the province.

In the afternoon, carriages were in waiting to convey the committee to the ground for the trial of the ploughing implements, a field in the neighbourhood of the city (Steindemer Thor) granted for the purpose, by Herr Buholt-Trenk. The

brilliant weather attracted a great concourse of the visitors. A large number of machines of every description of construction, new and old, were put in motion, and the result was most satisfactory. Among them were a number of English (Bayley), Scotch, and American ploughs: The latter are coming fast into use throughout Prussia. The trial was conducted by the Herren Caspar-Radnicken, and Fritze-Fuchshöfen, and was continued till a late hour this evening. The judges were Baron Von Hoverbeck, Herren Von Heiligenstädt, Papendieck, Padlech, and Winkler.

SECOND DAY.—(Thursday.)

The business of the association was formally opened this morning at 9 o'clock, by the President, Herr Jachmann, in the Hall of the *Deutschen Ressource*, after which the various sections commenced their labours under the charge of their respective officers, Herr Conrad Frantze, Herr Papendieck-Liep, Councillor Gamradt, and Dr. Dreszler. The papers and subjects mentioned in the report of yesterday's proceedings were read and discussed with great spirit and ability. (Particulars in our next.) The sections were all very numerously attended, and the meetings were adjourned at about half-past one; when the members and their friends proceeded to dinner. At the various hotels and restaurants ordinaries were prepared, and presided over by some of the officers of the association, and mirth and good-humour prevailed in every circle.

At 5 o'clock, a large party under the conduct of Herren Busolt and Fritze proceeded to the Hufen to witness various experiments, and a further trial of implements. Ploughing, mowing, and other machines were then exhibited at work, to the general satisfaction of the spectators. Judges:—Herren Jachmann, Siegfried, Von Kries, and Ammon. Some Scotch and Belgian implements excited great interest.

It had been intended to close the day's proceedings by a general meeting in the Friedericischen-garten, with concert, &c.; but owing to the unfavourable state of the weather, the meeting was held in the Deutschen Ressource, where papers of interest were read, and music and refreshments given throughout the evening. Several smaller circles were also formed.

During the day the exhibition of implements, machines, and agricultural productions held in the exercise house, König's-Garden, was thronged by a mass of visitors.

The tasteful and elegant display made by the Königsberg Horticultural Society, in this and other departments excited great surprise and admiration. Flowers of every description, cut and in pots, filled the tents, and the arrangement of the machines was delightfully relieved by the finest horticultural specimens; an enumeration of which it would be impossible to give in this general report. The judges were engaged during the whole afternoon in deciding on the merits of their respective classes. The fruits and vegetables exhibited were all particularly fine.

The day's list of arrivals is very large, and includes the names of Baron Von Kendell, Baron Von Meyendorf, Graf Von den Gröben, Graf Dohna, Captain Von Bergfeld, Major Behrendt de Couvry, Councillor Schleuther, Baron Hensche-Pogrimmen, and De Terra-Lauth, Herren Gutsbesitzer, Von Below-Hohendorf, Von Scharfenorth, Von Wunck, Von Oldenburgh, Councillor Von Pequilhen, Von Esebeck, Von Tyszka-Ribben, Von Kalkstein, Von Den Goltz, Von Neuschütz, Von Götzen, Von Bieberstein, Von Wangenheim, Ogilvie, Fink, Skott, Guttzeit, Valentine, &c. &c.

THIRD DAY.—(Friday.)

The proceedings were opened this morning, at half-past 9, by a general meeting of the members in the Grand Hall of the Deutschen Ressource, presided over by Herr Jachmann, general councillor of the Chamber of Agriculture, and president of the association, who delivered a very interesting address on the origin and state of the association, and the present position and interests of agriculture in the province. The address was listened to with great interest by a very crowded assembly. The report of the general secretary was then read and adopted, as well as those of the respective sectional secretaries of the preceding days' meetings. Other papers and subjects belonging to the general meeting were then duly discussed, and after some speeches of interest, and a vote of thanks to the chairman, the meeting adjourned at 1 o'clock.

At this time the general committee proceeded to Königs-Garten, for the purpose of opening the cattle-show. The garden was only opened to the committee, the exhibitors, a few specially invited guests, and the judges for the cattle-show, who continued their duties during the afternoon, notwithstanding the fearful inclemency of the weather.

As on the preceding day, ordinaries were formed at the hotels, &c., each under the guardianship of some "choice spirit;" and as the weather was so unpropitious for out-of-door amusements, the company at each was select and numerous.

In the ing, shortly after 6 o'clock, the weather having cleared up, a steamboat excursion was made to Holstein on the Pregel, where a concert, &c., was held The company returned to town at a late hour. Throughout the city various entertainments and amusements were held.

Amongst to-day's arrivals are—Graft Kleist, Government Official Kosmack, Councillor of Justice Nehelung, Baron Von Sanden-Kinschen, Colonel Gregorowins, Councillor Lausser from Riga, Councillor Groddeck; Herren Gutsbesitzer Von Schan, Von Spies, Padleck-Pülz, Burgomaster Behrendt, Lieutenant Von-Reinicker, Von Sasz, Von Gottsberg, Von Golzheim, Schulz, Warkentin, Von Ziegler-Bothan, Von Ziegler-Johannsthal, Von Frankenburg, Von Brandt-Rossen, Von Brandt-Pellen, Von Brandt-Hasselbusch, Von Massenbach, Von Heyden, Von Kleist, Krause, Georgesohn, Simpson-Berkincken, and about 150 others. Numerous of the highest nobility were guests of the city officials.

FOURTH DAY.—(Saturday.)

The sun shone brilliantly this morning on the hastily-decorated area in which the cattle-show was to be held, and the whole city was alive with expectation as to the "grand day" of the festivity. So early as 7 o'clock the gates were opened for the exhibitors, subscribers, and visitors; shortly afterwards the judges and commissioners arrived. During the morning an immense concourse of visitors, of both sexes, arrived; including many of the highest civil and military authorities of Konigberg, amongst whom may be mentioned his Excellency Herr Eichmann, Chief President of the Province; his Excellency General Graf Dohna, Commander-in-Chief; their Excellencies General Von Below, General Graf Schndorff, General Von Plehive, with their Adjutants; Herr Sperling, chief magistrate of the city, several of the consuls, and numerous others. The ladies of Konigsberg were also in full force, and contributed much to the gaiety of the scene.

At 11 o'clock the gates were opened for the admission of the general public, when the procession of prize cattle and

distribution of prizes commenced. At this moment König's Garten presented a most animated scene: flags and banners of every description, size, colour, and design waved from all parts of the space, and wherever horticultural effects could be displayed the eye rested on groups of flowers and garlands. A chair of state for the President was erected against the grand statue of his late Majesty, surrounded by tribunes for the civil and military authorities, and a complete show of ladies, with many other invited guests. The prize cattle, decorated with flowers, were led past the chair of the President, General Councillor Jachmann, who then delivered the prizes in a short but appropriate speech. Most of the company soon left the gardens, but the exhibition was kept open till 6 o'clock.

The show may be considered in most respects as very satisfactory, both as regards the quality and quantity of animals exhibited. In Prussia, the principal attention is bestowed on the breed of horses, so many being required for military and government purposes, the entire conveyance of breeders being in the hands of the government postal authorities. The royal training studs are very extensive, and the labourers throughout the country are encouraged to pay particular attention to this branch of agricultural science. On the present occasion, the royal training stud at Trakehnen (famed also for its racing horses) contributed 36 first-rate animals, amongst which were three very superior conditioned mares, with foals, and some fillies of great promise. The supply of labourers' horses was very large, particularly some fine working stallions, and six prizes were bestowed on them. The stables of the Herren Von Simpson, Hensone-Pogrimmen, Graf Keyserling, Herren Von Kendell, Von Below, and others also contributed their full share. A splendid lot of fillies, belonging to the latter, drew much attention. In this country but little attention has as yet been paid to the breeding of fat cattle, and beasts as witnessed at English prize cattle shows are here not to be seen. Good working animals claim much attention, and beyond these but little can be said of the black cattle. There were, however, four very curious specimens of a sort of Buffalo-oxen, from the estate of Graff Keyserling, which attracted great notice; they are said to be a breed from the south of Russia; the colour is completely black, the hide being totally devoid of hair, except long bushes hanging down from each side of the head. There were some fine litters of young pigs, and several good boars of English breed. With regard to sheep, the only point here considered is the quality of the wool, for which Prussia (and Saxony) is so world-renowned. The number of animals in this department was very numerous, the finest being from Bellschwitz, the estate of Baron Von Brünneck, and one of the most extensive in the province, producing annually about 120 cwt. of the finest wool. The latter gained the medal at the Great London Exhibition of 1851, also the medal of the Paris Agricultural Society, of which body Baron Von Brünneck has been elected a member. A list of the prize holders in my next.

At 3 o'clock, the grand banquet took place at the City Assembly Room (Kneiphöfschen Junkerhof), and was attended by most of the officers of the association, and a very large party of the nobility and gentry. We have not space to enumerate the toasts that were drunk, and speeches which were made; suffice it to say that every one is delighted at the re-establishment of the association, as an evidence of improvements in agricultural affairs, which it is hoped future similar attempts will increase. For the benefit of your German readers, I give a list of some of the "good things" at the banquet, consisting of about sixteen courses, the caterer being Herr Berger, of this city. Suppe von Indianischen Vogelnestern; *Bœuf au naturel* mit Capern und Anchovy Sauce; Kartoffeln *a la* Strasbourg, Fischsautées; Leipziger Allerlei mit Roillirten Sardinen; Spargel mit Kalbssautées; Fricassée von Aal; Koillirte Aühner und Tauben mit Rimoulad Sauce; Zaud *au four*, Apfelsinens; Mehlspeise; Leudenbraten mit Sellerie salat; Junge Gäuse mit Compot, Chocoladen-Crême; Eis *a la* Nesselrode; Vanille-Crême; Cradin von Fischen mit Muschel-sauce; Italienischer Salat; Pudding *a la* Figaro. Dessert: Ananas, Käse, &c.; Früchte von allen Sorten; thirty Sorten der feinsten Weine.

During the banquet, the Amateur Musical Society enlivened the scene by the execution of a number of charming glees, quartets, and other vocal music.

Shortly after 6 o'clock the company separated, in order to be present at the drawing of the lottery prizes, which had commenced under the inspection of Councillor Krause. This was a scene of great mirth and amusement, and lasted a considerable time. A large body of visitors met at Bauer's Garten, in the Tragheim, and the evening was passed here and in other circles in the most festive manner.

Thus ended, with great satisfaction, the first grand re-union of the four societies of the Prussian Agricultural Association.

It had been intended on Sunday to have formed a party of visitors to proceed to Fuchsberg, near Königsberg, the estate of Herr Oppenheim, for the purpose of viewing the draining operations in progress there, under the conduct of M. Le Clerc, the Belgian government engineer, but the works were not in a sufficient state of forwardness to justify the excursion. Drainage is, however, beginning to engage the attention of the government, as well as land-owners. The Prussian Chamber of Agriculture appointed a government engineer to proceed to England last year for the purpose of acquiring a thorough knowledge of the English draining system. This gentleman, Herr W. Lücke, has since been engaged in draining Trebnitz, the estate of Graf von Brünneck, near Berlin, and is now similarly occupied in the extensive property at Bellschwitz, the seat of Baron Von Brünneck, and is also in general request throughout the province, his appointments to the various estates being directly from the government. Whitehead's machine is used for making the tubes.

In my next I shall give you the list of prizes and prize holders, and some account of the sectional meetings.

Yours obediently,

H. M. M.

ON THE DISCOVERY OF AN ARTIFICIAL MANURE AS FERTILIZING AS PERUVIAN GUANO.

Can a manure to sell at £5 per ton in large quantities ever be discovered equal to guano in its fertilizing qualities? This is a question which must henceforth engage practical agricultural chemists,

for the Royal Society of England and Wales has offered—or, at least, agreed to offer, and submitted to a committee the conditions of the competition—a premium of one thousand pounds and the Society's gold medal for the discovery. Soon as these conditions are published, every chemist will have to set his wits to work to put nature and science on the rack to discover if any compound of the skill of man can equal the natural deposit guano.

On the fertilizing properties of guano it is now ridiculous to dilate. It is proved to be one of the best, if not the very best, of manures; and it is only the fearful ten pounds per ton which makes it so comparatively little used. Now it is pretty well known, that guano contains certain definite quantities of but a few chemical compounds—salts of ammonia, phosphates, organic matter, a small proportion of alkaline salts, and some small quantity of sand and moisture. The organic and ammoniacal parts are about one-half; the phosphates about one-third; the water and sand about one-eighth. Nor are these salts in any very complicated combination. They are rather free than fixed by any powerful affinities, and are kept freer, dissipating by exposure, mainly, from the small amount of moisture they contain.

Now, there is not an agricultural chemist in the kingdom who cannot get all the elements of guano and mix them and make a manure as good as guano itself, if he were to be regardless of cost. But the materials will cost him a considerable amount.

His ammoniacal salts will cost 7s. 0d. per stone.
His phosphates ..... 1s. 0d. ,,
His organic matter, at least, 1s. 6d. ,,

And these are not perhaps so purely manurial, but mixed with other matters, so as to make a ton of the mixture scarcely equal to a ton of guano.

But where can he get his supplies? The ammoniacal matters he can get from the refuse of a variety of manufactures. The salts of the ladies' smelling bottles were one day obtained from the *drainage* of the stable. Now, however, they are obtained from the gas water, from the manufacture of alum, and from a great variety of substances. Ammonia comes from the refuse and the dross, and may therefore be easily imagined to be cheap. And if it could be successfully used as it separates, it would be so; but it cannot. It is mixed with a thousand foreign matters. It has to undergo a variety of costly processes—processes involving time and labour and materials; and hence it costs money to obtain it in a state moderately pure; and here the manufacturer, the bleacher, the dyer, and a variety of others come and claim it, and give for it an amount which the farmer cannot afford. This is just the case with sulphuric acid. The farmer must buy it impure. Condensed by water in its formation, it has again to be separated from that water for which it has considerable affinity. To drain this off is costly; but, to drain the last portion is highly so; and here the farmer finds it good economy rather to pay for a certain per-centage of water than pay for its final extraction. It would be so with ammonia in any of its forms, as muriate, sulphate, or carbonate.

Take, again, the phosphates. They are perhaps somewhat more easily obtainable, but not in a very pure state. If taken as they exist in bones—in a very favourable form—they can hardly be got, thoroughly pulverized, for less than £6 or £6 10s. per ton; and of this, a somewhat large per-centage is water; and the alkaline salts of lime, for instance, will exceed the proper proportion for guano making. Hence, it is hardly possible to obtain bones at the price necessary to procure them, as a considerable constituent of the extemporaneous guano.

With the mere organic matter there might be less difficulty; possibly the blood of the slaughter-houses might be mixed with bones, and so both be supplied, the organic matter and the phosphates. But, it must be remembered, it must be thoroughly dry to come into the composition; must be dried by artificial heat; and must, therefore, be a costly material—say, over £8 per ton, including moderate carriage.

Guano being ready-made—made without cost, and only having a monopoly between its owners and the farmers—is the readiest combination of the materials of fertilisation; and, as these materials come into no competition in that state, with the wants of manufacturers, they fall by common consent to the farmer in the growth of his crops.

Now, the coprolites are perhaps the only materials where the farmer can get phosphates cheap; but they are so impure, if used to mix for guano, that they would cost as much purifying for the purpose, as if we had recourse to the bone phosphate at once.

Hence we see, we fear, little prospect of the prize ever being successfully claimed. That competitors will arise; that the conditions will be practical and stringent, and sufficient to test the qualities of the manure we doubt not, but we fear it will be like the large premium of the Highland Society for the successful application of steam-power to agriculture—be a standing subject for some years to come.

Not that we for one moment disparage the attempt. It will do good. The mere stimulus of the scientific mind to the subject will bring out discoveries of some hidden stores of manure now possibly unthought of, and possibly have the effect of beating down at least the Peruvian monopoly, and reducing the price of guano itself. By documents published by the House of Commons, we perceive, they estimate the guano deposits at 27,024,493 tons; so there need be no fear of a rapid exhaustion.

The agitation of the subject must be beneficial. —Gardeners' and Farmers' Journal.

SEVERE HAIL STORMS.

Although in some seasons instances occur of serious and extensive damage to crops by hail in one or two districts, it rarely happens that the disastrous consequences of these visitations are extended so generally throughout the kingdom as in the present season. The first storm occurred on the 5th June; others, and the most serious, in the month of July. The crops are now rapidly advancing to maturity, but farmers should not lull themselves into security on that account. The storm which did such awful damage in 1843 occurred on the 9th of August.

It will be seen by reference to the advertisement that the cost of insuring the ordinary crops is only *sixpence* per acre.

Nearly eighty persons who were insured in the Royal Farmers' Office have experienced losses; but they will of course have these losses reinstated. They are resident in the counties of Berks, Somerset, Hants, Cambridge, Suffolk, Gloucester, Worcester, Bucks, York, Northampton, Oxon, Norfolk, Wilts, and Warwick.

Storms of June 5th, 14th, and 15th.

Sutton (Kent).—The recent hailstorms have visited this part of the country. A field of eight acres of peas, the property of Mr. Richard Marsh, of St. Clements, Sandwich, situate at Sutton Farm, has been injured to some extent. Fortunately Mr. Marsh is covered by insurance against hail in the Royal Farmers' Office. A great deal of damage has been done by the same storm in the Isle of Thanet, the parties, we understand, not being insured.

Stow Bardolph (Norfolk).—One of the most awful hailstorms ever seen in this part of England occurred here on Monday, June 14, at one o'clock. The stones which fell were as large as marbles, and the crops wherever they fell were cut to pieces. Mr. Wm. Betts, of Park Farm, Stow, has had great damage done to his corn. However, in consequence of his having had the precaution of insuring with Mr. Mumford, of Downham, the respectable agent of the Royal Farmers' Insurance Office, his loss will be promptly paid by that company.

Leckhampstead (Bucks).—On the same day this part of Buckinghamshire was visited by a very heavy hailstorm. A field of winter beans and peas, the property of Mr. Wm. Henry Brickwell of the Home Farm, Leckhampstead, was seriously injured; but luckily the party was insured in the Royal Farmers' Office, through Mr. James Harrison, jun., of Buckingham.

Brentwood.—On Tuesday, June 15, a very severe hailstorm, accompanied with thunder and lightning, passed over Brook-street, and part of South Weald, destroying a great number of windows. The hailstones were very large, some being picked up near Brentwood as large as moderate sized walnuts. In the brick-fields much damage was done, in one instance to the extent of £50. The fruit-trees have suffered severely.

Ely (Cambridgeshire).—A very heavy hailstorm occurred within three miles of Ely. We have not heard the extent of damage done to the crops, but we believe it was severe.

Northampton.—On June 14th a heavy storm passed over a part of this county, doing considerable damage to the crops, more particularly in the neighbourhood of Daventry. The hail fell heavily in the vicinity of Bradfield-on-the-Green, The principal portion of the cropping damaged was not insured. Some beans, belonging to Mr. Downing, were damaged. They have since been surveyed, and the amount of damage paid by Mr. Wetton, of this town, agent to the Royal Farmers' Hail Insurance Company, in whose institution the crop was insured. —*Northampton Herald.*

Lynn, Norfolk.—A thunderstorm passed over Lynn on the same day without, however, doing any damage. The hail at Stradsett and its neighbourhood was unusually severe; and we are informed that the crops on two or three farms have been very seriously injured, particularly the beans.—*Cambridge paper.*

Stoke Ferry.—The neighbourhood of Stoke Ferry was visited with a very violent tempest on the same day, when two cows were killed by the lightning, and a tree shattered. The crops of Mr. Curtis, of Cavenham, and Mr. Newman of Stradsett, are also reported to have suffered to a very great extent from the hail, which fell in unusual quantities, and in lumps of considerable size. We hope they were insured.—*Norfolk paper.*

Corby.—A thunderstorm passed over Corby on the same day, about noon, accompanied with hail. At Hawthorpe, the hail fell in great quantities, as large as marbles, and did much damage to the crops. After the storm, the ground was covered to such an extent with hailstones, that they could be gathered by wheelbarrows-full.—*Lincoln Chronicle.*

Pymoor and Oxlode.—Hail Storm.—On the same day, about 12 o'clock at noon, Pymoor and Oxlode were visited by a terrific hailstorm. Several acres of wheat and beans were completely beaten down; trees were stripped of their foliage, and have now the appearance of the latter end of autumn. The hailstones were of an extraordinary size, and we fear much damage has been done by the storm. Loud claps of thunder and vivid flashes of lightning made it the more awful.—*Cambridge Independent.*

On the same day a very severe hailstorm, accompanied with thunder and lightning, passed over Brook-street, and the southern part of South Weald, destroying a great number of windows. The hailstones were very large, some having been picked up near Brentwood as large as moderate sized walnuts. In the bean fields much damage was done; in one instance, we learn, to the extent of £50. The fruit-trees have suffered severely. Amongst the sufferers at Brook-street, are Mr. Goodchild, Mr. Morgan, Mr. Pabby, Mr. Shipman, whose windows are broken, and the fruit trees much damaged. In a garden belonging to Chas. Porter, the peas, beans, and potatoes appear as if they had been mown off. The gardens of nearly all the cottagers are more or less damaged.—*Chelmsford Chronicle.*

Storm of June 21st.

Petworth.—During the sitting of the bench, we were visited by one of the severest storms we have had for many years. The lightning was very forked, and so vivid that the court-house was completely illuminated at the time with the flashes; the rain and hail poured down in a complete deluge. The corn is knocked down a good deal in places, and many fields have had a great quantity of soil washed away.—*Sussex Express.*

Wakefield.—A terrific thunder storm passed over this place on Monday, June 21, accompanied with the most severe hail storm that has visited us for years past, some of the hailstones being nearly the size of ordinary marbles. The damage done to the crops, we understand, is very great. In the villages of Birstwith, Hampsthwaite, Hartwith, Bishop Thornton, and Markington, the damage done is, we understand, very serious.—*Leeds Mercury.*

Shaw Mills, near Ripon, and the adjacent neighbourhood, were visited on the same day by a tremendous thunder-storm It commenced at half-past three P.M., and continued without intermission for upwards of two hours. The lightning was truly terrific, accompanied with a perfect deluge of rain, and hailstones of extraordinary size.—*Ibid.*

Driffield.—On Monday last we had some heavy thunder-showers of rain and hail, some of the hailstones being as large as horse-beans.—*Hull Packet.*

Kettering.—On Monday morning last, at about ten o'clock, Kettering and its vicinity were visited by a heavy-thunder-storm, the first of the season. As the storm approached the lightning was very vivid, in a zig-zag form, and the thunder loud and of an unusually crackling kind. Torrents of hail and rain fell, but the storm appeared more in a southerly and south-westerly direction.—*Bedford Times.*

On Monday last, Chester and its neighbourhood were visited by a thunder-storm so awfully grand that of it could be truly said by every one, "I never saw such a thing in my life." Up to noon the weather was fine, but the tokens of a storm were then thickening, and soon after one o'clock the lightnings began to flash, and the thunders to roar, and hailstones fell, some of which measured nearly two inches in circumference. Sky-lights and windows in abundance were broken, and many of the streets were flooded. In Manchester and its neighbourhood a considerable quantity of property has been injured.—*Chester Chronicle.*

On Monday afternoon began over the township of Birstwith such a storm of thunder, hail, and rain, as is not in the remembrance of the oldest person living in the neighbourhood. During the morning distant thunder had been occasionally heard, but at two o'clock the storm commenced and remained stationary over that part of the parish near the Wreaks village. At that time the rain began to pour down, mingled with hail-stones, which knocked against our windows like flintstones, and the loudest peals of thunder accompanied the lightning's flash; all the while the rain descended in torrents, and the darkness was most remarkable, for our rooms looked gloomy as a winter's evening. The storm continued with the utmost vehemence until about half-past four o'clock, and the effects in the roads and fields have been very disastrous. The waters collected and flowed in a breast, bearing down the most substantial wall fences, and in the roads ploughing up the hardest surfaces to the depth of several feet, and carrying away the largest stones to considerable distances. At length, a brightness appearing in the west, and the wind rising a little, the storm abated, when it was soon discovered that great damage had been done to property in this township, both on the roads, fields, and gardens, by this awakening visitation of Almighty God.—*A Correspondent of the Leeds Intelligencer.*

The *Carlisle Patriot*, in alluding to the number of hail-storms reported from various parts of the country round, states as follows: "Many parts of the country have been visited by heevy hail-storms, accompanied by terrific thunder and lightning, and causing a *prodigious amount of damage.* Fortunately, in this locality we have been exempted from such a visitation. On Monday, in some of the manufacturing districts, very serious damage was done by the hail. The mills and other workshops, with conservatories and hothouses, were completely riddled; and fruits and vegetables have suffered very severely, over miles of country."

Manchester. — Considerable damage has been done to property in the town and neighbourhood of Manchester by a storm of hail, accompanied with thunder and lightning. Property in Pendleton, Eccles, and Patricroft, appear to have suffered most, and in these places mill and greenhouse windows must have been destroyed to the extent of some thousands of pounds sterling. At Patricroft the storm commenced shortly before three o'clock, and the hail descended in crystallized pieces of ice nearly the shape of pears. Messrs. Naysmith and Gaskell's works, called the Bridgewater Foundry, had between 2,000 and 3,000 squares of glass broken in the skylights over the sheds. Mr. Naysmith gives an interesting account of these crystals, some of which were more than an inch in length, which he says had evidently fallen the heavier end downwards. Augmenting in size as they descended, the successive layers of the crystals being clearly perceptible, the thickness of the stones had increased at an angle of 35, which is that at which water crystallizes. Three of the hailstones picked up at Eccles weighed an ounce and three quarters. At Eccles the cotton mill of Messrs. John Chadwick and brothers suffered to the extent of upwards of 5,000 squares of glass in the weaving sheds, besides glass broken in other parts of the mill. It is estimated that £200 will scarce make good the damage. The silk mill of Mr. Thomas Ainsworth, also at Eccles, had from 1,500 to 2,000 squares of glass broken in the weaving sheds. Here the pieces of silk in the looms suffered great damage, not only from the descending hailstones, which wetted the fabric and destroyed the colours for nearly a yard in length in each of about 230 looms, but from the pieces of glass knocked through upon them, cutting and otherwise damaging the silk goods they came in contact with. No estimate had been formed of the total damage in this mill, but it will be considerable. Many of the market-gardeners will have suffered much in this vicinity. Mr. Hindley had glass broken in his greenhouses to the value of £20. Mr. Charles Noyes, market gardener, Sandy-lane, had glass destroyed to the extent of nearly 2,000 squares in his greenhouses; Mr. James Fyldes had 3,000 squares of glass broken in his greenhouses; and Mr. Boardman of Barton, a market gardener, is said to have suffered a loss, in glass and fruit, to the extent of nearly £400. The hail has made sad havoc with fruit, especially with pears, apples, gooseberries, strawberries, and other kinds, in exposed situations, which are not only knocked from the trees, but cut to pieces in an extraordinary manner. The fruit in the pineries, at the seats of Sir John Potter, Baile Hill; Mrs. Cooke's, Sandy-lane; Mr. Edward Tootal, of Weaste Lodge, and other gentlemen, have suffered very seriously. Their greenhouses and other garden buildings are reported to have sustained the loss of many thousand squares of glass. The storm reached Pendleton about a quarter past three o'clock, and hailstones were picked up measuring three inches in circumference. These fell with great force, and many persons struck by them were much hurt. In the weaving sheds of Sir Elkanah Armitage's mill about 1,500 squares of glass were broken, and at his residence, which is near the mill, about 300 squares of glass in the greenhouse were broken. The darkness was so great during the storm that the machinery had to be stopped and the hands to leave off work. At the mill of Messrs. T. and J. Ashworth, Pendleton, about 1,330 squares of glass were broken over the weaving sheds, and they describe the hailstones here as being conical-shaped and crystallized at the thicker end. Some of them were fully an inch in diameter. The storm is described at all these places as having come from the west. It did not reach Manchester until about four o'clock, but it lasted until nearly five. The hail was not heavy at Manchester, however, though rain fell in torrents. The upper part of a chimney belonging to the Old Quay Carrying Company, at their premises on the left bank of the Irwell, in Water-street, Manchester, was struck by the lightning at about half-past four o'clock. About 30 feet of the chimney, which was about 75 feet high, was entirely torn down, and fell through the roof of a four-story warehouse below and an engine-house adjoining. The fall of the materials, about six tons weight of which fell upon the floor of the top story of the warehouse, was partially broken by a quantity of oats with which the floor was covered; nevertheless a portion of the bricks broke through into the third story. The roof of the engine-house also gave way under the weight of the falling bricks, and considerable damage was done to the engineman's furniture. It is believed that the engine has not been injured, but it has been stopped till the rubbish in which it was buried has been cleared away. The engine is a small one, used to work the cranes in this warehouse, and in another about 25 yards distant. The total damage may be about £100. No person was injured by the accident except one of the porters, who was on the premises, and who was slightly hurt by a falling brick. He was able to return to his work the next day. About two-thirds of the glass in a hothouse, about 30 yards long, at the residence of Mr. Robert Gardner, in Swinton-road, near Pendleton, was broken. A piece of ice, about three inches long, was found among the fragments of glass by the gardener; and another large piece, which came through a kitchen window, struck the arm of a servant girl with great force, by which she was considerably frightened, and at first thought the limb was broken. The glass in a

dome light and in several skylights in Mr. Gardner's house was also broken. Several other hothouses in the same road, including those of Sir Benjamin Heywood, Bart., Mr. Oliver Heywood, Mr. Barton, and Mr. Atherton, have sustained considerable damage.

On Thursday, June 24, about three o'clock, a storm of thunder and lightning, accompanied by hail and heavy wind, passed over Bristol. At Lower Easton, St. George's, and their neighbourhood, a good deal of damage was done to the gardens, trees, &c. In the grounds of Mr. J. Parsons, market-gardener, upwards of 100 cap-glasses were destroyed, many fine fruit-trees broken or rooted up, and general injury done to the crops. Mr. Hobbs and Mr. Gerrish, market gardeners, were also sufferers, but not to so large an extent. On the estate of W. Bevan, Esq., and in other parts, several trees were broken; and at the house of a gentleman named Bloomfield, a window was completely forced in.—*Wells Journal.*

Hail Storm of July 5th.

Doncaster.—A violent thunder storm passed over this town on Monday last. The heavy rain was accompanied by a storm of hail, and many of the hailstones were, we understand, as large as ordinary-sized marbles; cutting the leaves in their descent, and rendering the progress of pedestrians almost impossible. In the pastures, the cattle and sheep, alarmed by the fearful storm, sought for safety beneath the trees, along the lee of the hedge-rows, or wherever protection might be afforded. But in no instance, we believe, has a single animal been struck by the lightning. The labours of the scythe and of hay-making were suspended; and the corn crops, particularly the wheats, which are remarkably luxuriant and heavy, have, to some extent, been laid.

Trentside.—On the same day, in the Isle of Axholme, a fearful hailstorm fell. One of the most splendid crops of flax in the Isle of Axholme, some stalks of which are nearly five feet in length, is completely flattened. The crop alluded to is growing in Mr. Robert Brown's parks, to the south of the highway leading from Butterwick to Belton, and has been old swarth from the memory of man. At the commencement of the first storm, hailstones of an extraordinary size were seen in several places; at Ferry several squares of glass were broken. Crops on low badly-drained land will of course suffer most.

Ollerton.—The thunder storm, accompanied with hail and rain, passed over this place and neighbourhood on Monday last. The rain was very heavy and accompanied at intervals by hailstones of large size. The storm was at its greatest height from five o'clock to half-past, and from beginning to end lasted two hours. The damage done is, it is feared, most extensive; but it will not probably be correctly ascertained for some days. But no lives have been lost. In Ollerton, several squares of glass in the hot-houses and skylights have been broken. It is feared, however, that the crops have been much injured in the district over which the storm passed, as well as the fruit trees in the several gardens.

Whitwell.—In the afternoon of Monday last, such a storm of hail, rain, and wind, as has not been witnessed scarcely in the memory of man, visited this place. The full force of the storm seemed to fall at this place, and in the surrounding places we have heard it was not so severe.

Howden.—At Knedlington, a village about a mile from Howden, the hail has done considerable damage to the shrubberies and glass in the garden of T. Clarke, Esq., and also several windows have been broken in the village by the hailstones, which were as large as marbles.

Goole.—About four o'clock in the afternoon of Monday, we were visited with a severe storm of thunder, with a heavy fall of rain interspersed with hail. It is to be feared that we shall hear of damage done in the surrounding district.

Dodworth.—A tree was struck, and several windows broken by the hailstones.

Stratford-on-Avon.—On Monday afternoon this town was visited by a dreadful thunder-storm; torrents of rain fell, and there was some heavy hail. Considerable damage has been done in the neighbourhood.—*Banbury Guardian.*

Stamford and its neighbourhood were visited by a severe thunder-storm on Monday. Near Easton and other places in that vicinity, rain mixed with very heavy hail—pieces of ice, in fact—poured down in continuous streams, damaged the crops, and destroyed quantities of glass in the villages westward of Stamford. A correspondent writing from Thistleton, says—"On Monday last, a tremendous thunder-storm passed over this neighbourhood, in a north-easterly direction; the rain fell in torrents, flooding the streets in a few minutes; hailstones nearly as large as pigeons' eggs fell at Exton, breaking many windows. At Greetham, many trees were broken down, and several crops of corn severely injured."—*Lincolnshire Chronicle.*

The hail-storm on Monday last did a great amount of damage in the neighbourhood of Oxford. A large quantity of glass is destroyed, and the entire crop of corn in fields is cut to pieces.—*Banbury Guardian.*

On Monday, Derby and its neighbourhood were visited by a severe thunder-storm. Rain mixed with heavy hail poured down in continuous and unmitigated streams, and within a short time the street, roads, and thoroughfares were converted into river-courses, and for a long period they were nearly impassable, and property received injury in several instances.

Hail Storm of July 13th.

BERKSHIRE.—On last Tuesday, considerable damage was done by the hail-storm at Cole Henleigh, near Newbury. The crops of Mr. Joseph Bailey were much injured.

NORTHAMPTONSHIRE.—Geddington, near Rothwell, was likewise visited by the storm of Tuesday. Mr. Thomas Bell, of that place, had his peas and beans damaged.

HAMPSHIRE.—The storm o' Tuesday visited Whitchurch, Overton, Waltham, and Andover-road, doing very considerable damage to the crops. But few of the sufferers were insured. Messrs. Knight, Brothers, of Whitehall farm, in the Parish of Overton, had 70 acres of wheat, and 10 acres of barley injured.

WILTSHIRE.—Chippenham and its neighbourhood shared in the destruction caused by Tuesday's hail-storm. Mr. John Morris of Foxham, in the parish of Christian Malford, and Mr John Bethel, of Kellaway, adjoining Mr. Morris's farm, had their crops injured to some extent. The storm is described by a correspondent as having been "most destructive." Several other persons were sufferers to a great extent.

BUCKS.—This county has also been visited by the destructive storm of Tuesday. The crops of Mr. William Cox, at his farm of Moreton, in the Parish of Durton, suffered severely from the heavy hail.

The persons above named were fortunately insured in the Royal Farmers' Office; and we understand steps have been taken to value the damage. Many other farmers in those districts whose crops were injured were not insured.

CALNE.—This town and neighbourhood were visited on Tuesday last with another violent storm of rain and hail, accompanied with thunder and lightning; the country for some miles to the north and east of the town experienced the most violent raging of the storm. A lump of ice was picked up about a mile from Calne, which measured 4½ inches in circumference. The greenhouses belonging to G. H. Walker Heneage, Esq., at Compton Bassett, were much damaged.—*Wilts Mirror.*

ANDOVER—On Tuesday afternoon, about three o'clock, this town and neighbourhood were visited by a sudden and very heavy storm of thunder and lightning, accompanied by hail, which fell in very large pieces and caused serious damage to windows, conservatories, &c., but more particularly to the growing crops of corn. In the neighbourhood of Whitchurch, Longparish, and Hurstbourne Priors, the storm raged with terrific fury, and devastated the crops of corn to a most serious extent. Mr. G. Oborne, of Hurstbourne Priors, is said to be a sufferer to the extent of £500. The ears of corn were completely stripped off the wheat, barley, &c., as clean as though thrashed with the flail. Turnips were forced from the ground and carried away by the floods. The rain descended in torrents, and filled the streets of this town to overflowing. The Star Hotel was inundated, as were also

several other houses in that vicinity. At Andover Road station the water overflowed the railway, and was stated to be upwards of two feet in depth. For a considerable time the trains were unable to proceed.—*Wilts County Mirror.*

GLOUCESTERSHIRE.—On Tuesday evening the pretty little town of Newent was visited with one of the most awful and destructive storms that have ever occurred within living memory. It commenced about half-past 6 o'clock, and continued to rage with extraordinary violence till nearly 8. The day had been intensely and almost insupportably hot, and before the storm burst forth in all its fury the thunder had been rumbling and grumbling in the distance for some time; but no indications of the frightful scene which subsequently occurred had presented themselves, when suddenly the whole hemisphere as it were became shrouded in thick darkness—darkness that might almost be felt: lurid lightning flashed about in every direction, flash after flash succeeding each other with fearful rapidity, followed by such roars of thunder as seemed to shake the firm earth to its very foundation, and filled the stoutest with dismay and apprehension. At the onset of the storm a perfect deluge of rain descended, but that was soon followed by such a torrent of hailstones as no living thing could safely face, scattering destruction in every direction. We regret to say that very considerable damage has been done. Nearly every house in the town has been injured more or less, and the glaziers, who are in great request, will reap a plentiful harvest. Nearly every window in the Independent Chapel (a neat and ornamental building, which was recently erected by subscription) was broken. The worthy minister had many windows in his house demolished. Nearly the whole of Mr Edmunds's splendid conservatories at the Pigeon-house are destroyed, and the windows at the back of Captain Parry's house, which were exposed to the full fury of the tempest, resemble those which at no distant period were to be commonly seen in sundry parts of Paris, when the great *coup d'etat* was struck by the Prince President. The crops in the immediate neighbourhood have been sadly handled. The greatest sufferers are Mr. Probyn, of Southerns; Mr. Thompson, of the Moat-house; and the master of the harriers, Mr. Richard Foley Onslow. This morning the hailstones which had fallen were gathered up by pailfuls, and many of them were as large as walnuts. The inhabitants of Newent will long remember the storm of Tuesday, the 13th of July, 1852.

YORKSHIRE.—On Tuesday and Wednesday evenings last, Keighley and neighbourhood were visited by very severe thunder and hail-storms. The former evening it commenced about ten, and continued until after midnight. The lightning was almost continuous, flash succeeding flash with scarcely any interruption, lighting up the valley of the Aire with a brilliancy indescribable. On Wednesday night the rain descended in torrents, mixed with hail, and caused considerable damage to the wheat crops in the neighbourhood.

Hail Storm of July 16.

(Abridged from the *Worcester Chronicle*).

On Friday night there was as tremendous a storm as any remembered by the oldest man living, though not of longest duration. The heat during the afternoon had been most intense; towards seven o'clock a previously bright and unclouded sky became suddenly overcast, and clouds heavily charged with electricity were observed travelling rapidly across the heavens, as if making for a common centre. Apparently but a few miles westward of Worcester, the thunder claps were truly awful, and, it may be said, pealed forth in a continuous roll which lasted more than half-an-hour; the lightning being even more vivid and alarming than that of the preceding days. The storm was accompanied by a violent hurricane, or what perhaps might not be inaptly termed a young tornado, and the damage it occasioned, we regret to record, is of the most serious, and for these parts unusual character. The storm, as far as we have been able to ascertain, gathered and first vented its fury in the district between Leigh and North Malvern, from thence taking an easterly direction, it appears to have exhausted itself in the neighbourhood of Alcester and Inkberrow, having Upton for its outer boundary to the south, and Stourport and Kidderminster on the north. At the Great House Farm, Leigh, belonging to Mr. Robert Hill, a crop of barley, which would have been fit for the sickle in a fortnight, was injured to the value of £250, and scarcely six bushels per acre will be realized where ten times that quantity might have been expected. Other crops at this place also suffered severely, cottages were unroofed and trees blown down. At Hopton Court, the residence of A. S. Featherstonhaugh, Esq., nearly the whole of the windows of the mansion and outbuildings were demolished by large hailstones. The gardens and conservatories on the rising ground at Henwick were also greatly injured. At Ombersley, the hailstones measured more than two inches in circumference, the road being immediately inundated with rain to the depth of several inches. The injury to the crops generally in the districts visited is fearful, but to particularise the whole of the damage already under our notice would occupy too great a space. The neighbourhood of Stourbridge—Oldswinford, Hagley, and Clent—has shared in the damage; considerable quantities of glass and other property have been destroyed at several residences. In some instances, we regret to add, the corn and pulse have suffered, the hail having completely severed the ears from the stalks. At Mr. Addenbroke's, several hundred panes of glass were broken, and a portion of the garden wall, with stone foundation, also washed down. At Hagley Hall, the damage was extensive, upwards of 2,000 panes being destroyed, some of which were of strong plate glass. At Elmley, Cropthorne, and Netherton, the crops, both of corn and fruit, have sustained considerable damage, particularly at the latter place, on the farm of Mr. Pearce, whose windows were also broken by hail, and pieces of ice of various forms and size, some of which were found two inches across, the following day. At Chaddesley Corbett the tempest came on from the west about 6 o'clock, the wind at the same time blowing from the east. This continued for about an hour without rain, when the wind gradually veered round to the west, and a fearful storm of hail, or rather ice, immediately began, and continued for about twenty minutes. The stones had the appearance of broken ice, being perfectly transparent, irregularly shaped, with jagged edges, varying from four to six inches in circumference. The loudness of the thunder, the vividness of the lightning, and the fury of the dangerous missiles which were carried with the broken glass to the extremity of the rooms gave terrible evidence of elemental fury. As the hail abated the rain came down in torrents. And fears being entertained of a land flood, the sluices at the different pools were opened. The storm finally went off toward Hagley about 8 o'clock. All the windows in the parish facing the storm are completely gutted. The generality of them being small squares, the lead in most instances is also considerably damaged. The church has the glass in the belfry and one of the west windows entirely demolished: the other window, being protected by wire lattice, escaped. Not a whole pane is left in the vicarage nor at the new girls' school. A. Turner, Esq., of Plenemore, has lost 800. The greenhouses at Winterfold (Rev. T. Harward's) are also destroyed; 48 large panes at Rushock rectory were broken. Not less than ten thousand panes in the village are gone. Mr. Peter Bough, having the most windows, has suffered to the number of 500, and Mr. Samuel Bough, at the Talbot, 250; while the crops of beans, peas, &c., in their gardens are destroyed. Such was the force of the hailstones that whole fields of wheat and barley were laid, only an ear here and there remaining. The straw being completely broken in the middle, and the ears embedded by the fury of the rain, the crop is rendered comparatively worthless. The stems of the potatoes were cut through, and the fruit knocked off the trees in heaps. The only damage done by the lightning was at the Lower House Farm, where an oak was split down. Several apple trees at the same place were blown down. The total damage in the parish will amount, it is estimated, to £4,000. The first strangers who appeared after the storm were two countrymen on Saturday morning. Being unacquainted with the *modus operandi*, they gazed from house to house with undisguised astonishment, opening their eyes and mouths in sympathy with the gaping windows. At length their ominous silence was broken with "Lor, Jim, whatever have 'em been up to here!" "Ugh, only one of them ere 'lectioneering tricks depend on't." "I 'spose so, but I wonder what side 'em be on." "Doant know, but 'em *has* done it nicely however, and no mistake."

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weath.
Day.	8 a.m.	10 p.m.	Min.	Max.	10 p.m	Direction.	Force.	8 a.m.	2 p.m.	10 m.	
	in. cts.	in. cts.									
June 22	29.66	29.67	47	65	53	S. West	brisk	fine	cloudy	fine	rain
23	29.72	29.82	49	71	52	W.S.W.	gentle	fine	sun	fine	dry
24	29.95	30.06	49	68	55	W., var.	gentle	fine	sun	fine	rain
25	30.05	29.85	48	74	60	SW., SE., SW.	var.	fine	sun	cloudy	dry
26	29.75	29.80	55	68	55	S.E., S.W.	var.	cloudy	cloudy	fine	rain
27	29.85	29.78	52	68	55	S. West	lively	cloudy	cloudy	fine	rain
28	29.78	29.80	52	66	55	S. West	gentle	fine	cloudy	cloudy	rain
29	29.80	29.77	54	67	53	S. West	liv. var.	cloudy	sun	fine	rain
30	29.80	29.92	53	69	55	Westerly	forcibl.	fine	sun	fine	rain
July 1	29.99	30.10	50	70	57	W. by S. or N.	var.	fine	sun	fine	dry
2	30.10	30.12	52	69	56	W. S. W.	lively	fine	sun	fine	dry
3	30.17	30.16	51	75	62	S. West	gentle	fine	sun	fine	dry
4	30.12	30.00	59	79	70	S. by East	soft br.	fine	sun	fine	dry
5	29.95	29.90	66	85	73	S.E., South	same	fine	sun	fine	dry
6	29.88	29.90	65	81	72	East	lively	fine	sun	fine	dry
7	29.94	30.02	64	74	64	East	lively	fine	sun	fine	dry
8	30.06	30.05	56	76	67	East	lively	fine	sun	fine	dry
9	30.05	30.02	59	84	70	S. by E. by W.	gentle	fine	sun	fine	dry
10	30.05	30.10	63	80	65	N.W., East	var.	fine	sun	fine	dry
11	30.16	30.14	59	74	63	Easterly	lively	fine	sun	fine	dry
12	30.14	30.08	62	71	66	Easterly	brisk	cloudy	sun	cloudy	dry
13	30.08	30.05	63	75	67	Easterly	brisk	cloudy	sun	fine	dry
14	30.02	29.96	63	77	65	Easterly	var.	cloudy	sun	fine	drops
15	29.95	29.95	69	80	69	Var., S.W.	liv. cal.	cloudy	sun	fine	dry
16	29.95	29.82	60	80	73	East, below	brisk	cloudy	sun	cloudy	rain
17	29.80	29.80	67	73	63	S. Westerly	gentle	cloudy	cloudy	fine	dry
18	29.86	29.90	56	73	63	Westerly	gentle	fine	sun	fine	dry
19	29.95	30.00	57	76	59	S. by West	gentle	fine	sun	fine	dry
20	30.05	30.02	61	73	63	Westerly	gentle	cloudy	sun	cloudy	dry
21	30.02	30.05	59	75	63	W. by North	gentle	cloudy	cloudy	fine	showery
22	30.05	30.12	57	76	69	N. West	gentle	cloudy	sun	fine	dry

ESTIMATED AVERAGES OF JULY.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.3	29.39	76	42	61

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
73.94	57.32	65.63

Weather and Phenomena.

June 22—Heavy clouds at noon. 23—Fair and warm day. 24—Heavy, thunder-like clouds; warm sun; fine evening. 25—Summer-like cirro-cumulous clouds. 26—Profuse rain last night; finer day; sunny gleams. 27—Brisk showers. 28—Showery; wet evening. 29—A shower; bright evening. 30—Sharp shower; wind lulls; and a clear evening.

Lunation.—First quarter, 24th day, 8 h. 47 m. evening.

July 1—Commencement of settled weather; the temperature increases, under the influence of an almost cloudless sun, till the 11th. 12 to 14, inclusive—A steady east current lulling towards sunset. 15—Wind becomes fluctuating; air oppressive; sun-heat excessive. 16—Very hot; lower current east; clouds collect at west at 6 p.m.; vivid and unremitting electric corruscations from 8 to 10; a little very distant thunder, and a fine rain follows. 17—Wet morning; since when the temperature has been summer-like, and by no means oppressive.

Lunations.—Full moon, 1st day, 3 h. 28 m. afternoon. Last quarter, 9th day, 8 h. 6 m. morning. New moon, 17th day, 4 h. 15 m. morning.

Remarks connected with Agriculture.—The weather has this year been periodical—June was completely wet; July to this date very dry and hot. The sun has in a degree scorched the wheat. We have seen this corn and several fields of barley approaching to ripeness, and in a week or so will be completely mature. Never was a stronger or more promising crop of corn seen by me; but hay is rather short, though fine. Potatoes are very healthy, yet the ground requires moisture. Roots can scarcely grow. J. Towers.

Croydon.

CALENDAR OF HORTICULTURE.

Plant-Houses.

Greenhouse plants of all sorts still requiring a shift must be attended to immediately, as it is important that they should be gradually brought into a state of rest. Such as have been sometime shifted, and have made a good growth, must now be exposed to all but very powerful sun, in order to harden the tissues, and to induce a free flowering habit. The Chinese and Indian Azaleas ought now to be sufficiently hardened to bear a free exposure to the sun, and will only require to be protected from heavy drenching rains. Be particularly careful that they do not want for water at the roots, but avoid saturating them, which is even more injurious than giving them too little water. In the conduct of these operations observe if there is any appearance of obstructed drainage, and let it be remedied immediately before the plants go to rest for the winter. The necessary attention to the drainage of plants required to be so long a time in a comparatively dormant state is probably one of the most important directions which a calendar writer can press upon the imperative consideration of plant growers; because, the effect of water applied to the roots (when applied in a greater quantity than is necessary to preserve their vitality) is to excite into growth; and therefore if the drainage is so imperfect that the water does not pass off freely and quickly, and that the ball of earth is as it were compelled to retain more than is necessary, the action of the roots will take place, and this will produce a corresponding reaction in the foliage; which, taking place at the time when temperature and other external conditions are only conducive to a state of perfect repose, cannot but be very injurious to the well-doing of the plant. As the season is approaching when it will be necessary to bring most plants into that state of dormancy or rest, which modern gardeners know to be one of the greatest essentials to good cultivation, it will be well to turn our attention to the subject with more than ordinary care; and depend upon it, the state of the roots, and more particularly root-moisture, is one of the most important items in the management of plants through the winter. Oxalis Boweana treated as formerly recommended is now one of the most beautiful and ornamental of conservatory plants. Let it be liberally supplied with water and sometimes some diluted liquid manure, which will also be of great benefit to Fuchsias, Balsams, late-flowering Geraniums, Petunias, and also Tropæolum Lobbianum. Look well to the state of the Chrysanthemums, and keep them growing in a vigorous manner, by frequent applications of liquid manure. They must have free exposure to the sun, and, remember, no more stopping. If mildew appears, dust them well with sulphur.

Forcing-Houses.

Pineries.—The vast amount of solar heat we have lately been favoured with has been highly favourable to these plants in their various stages, both for fruiters and successions. For all, except ripening fruit, care must be used to keep up a good supply of air moisture, and a free circulation of air, and still to pay the requisite attention to the state of the bottom heat, and see that it does not get too high. Look to the state of the roots of growing successions, and when they fill the pot give them a shift, and if into fruiting pots, let the shift be a roomy one. Continue the application of liquid manure to the roots. With regard to the ripening off the fruit, it will be well to remember that the slower the process the greater will be the flavour: any attempt to hasten the process by exposure to an unnaturally high temperature and too much drought, will not only lessen the weight of the fruit, but the sugary secretions will be partly converted into acid, and the flavour much deteriorated.

Vineries.—The borders of the later houses now swelling, the fruit will be benefited by copious supplies of liquid manure. Keep the houses in which the fruit is colouring free of atmospheric moisture, and let them have free ventilation night and day. The earliest houses now bare of fruit must be freely opened; in fact, keep the whole of the ventilators open to their utmost extent, and continue to check as much as possible the tendency to late growths. The same rule must be followed with the Peaches and Cherries, in order to get the whole of the wood thoroughly matured, as it is important to keep the foliage healthy to as long a period as possible. If mildew, thrips, or red spider appear, syringe them well with hydro sulphuret of lime, prepared according to Grison's directions as follows:—Mix intimately one pound of sulphur with a like volume of quick lime, and blend them with five pints of water, and boil ten minutes. When settled, pour the clear liquid off, and add to it from thirteen to fifteen gallons of water, stir it well, and syringe with it immediately. It may also be used with good effect on Peaches and Vines on the open walls.

Pits and Frames.—Melons and Cucumbers for late purposes must have attention paid to bottom heat, which, whether obtained from hot water, or by means of dung linings, must be maintained at 75 degrees. Keep the bines well thinned out, and practise stopping continually. Setting must also be resorted to for the late fruit. Cucumbers and Vegetable Marrows out of doors must be plentifully supplied with water in the absence of a good supply of rain.

Flower Garden.

See that bedding plants are confined to their proper limits, by pruning off exuberant growth around the edges, or by pegging in. The borders in the mixed flower garden should be kept hoed frequently; stakes applied in time to every thing requiring it; and all past flowering stems and other decaying foliage constantly removed. The work of propagation for another season must be gone into forthwith. Such things as Scarlet Geraniums, Salvias, and other free rooting plants, will do well put thickly into 24-pots in soil composed of half silver sand, and placed in a frame with a north aspect. I find an excellent plan to follow with Verbenas is to put in at once several handglasses full on a south border. Shade and water well until rooted; then give free exposure, and keep constantly stopped; early in September pot them three in a four-inch pot. We then place them on a shelf in a large pit, which is occasionally heated in very severe weather, and they will supply any number of very fine strong cuttings early in the spring. Pinks which have been struck under handlights must have free exposure, to harden them for planting out. Lose no time in getting a good stock of Cloves, Carnations, and Picotees layered. Prick out Queen and Brompton Stocks into nursery beds. See that the Viola arboria in reserve beds are abundantly supplied with water. C.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR JULY.

With a continuance of remarkably fine weather—even after making due allowance for the usual changes in the atmosphere, the result of excessive heat—the progress of the crops towards maturity this month has been rapid, and for the most part satisfactory. From all parts of England, even from what may be termed the poor districts, very favourable accounts have reached us in reference to the wheats. The blooming season, invariably a period of great peril to the crop, passed off remarkably well; and it is gratifying to be enabled to state that the ears are well and fully formed; and, further, that very few instances of blight have been met with. Thus far there is everything to hope from the future, because it must be evident to all engaged in agricultural pursuits that the yield promises to be quite equal to last year, both in point of weight and quality. As might be anticipated, therefore, the amount of business doing in all kinds of wheat in the various markets of the United Kingdom has been wholly confined to immediate wants—millers refusing to add to their stocks, under the impression that the value of wheat has not seen its lowest point—which, owing to the large arrivals of flour from the United States, and the numerous forced sales of that article, have been unusually limited. The fall in the quotations, however, has not exceeded 2s. per quarter; but this amount of decline *upon a low price* must prove a great drawback to progressive improvement. The barley crop has wonderfully recovered from its somewhat uneven and sickly appearance we have noticed in some previous reports. The yield will, no doubt, be a full average one; though, from the comparatively limited breadth of land under culture this season, compared with our actual wants, it is evident that it will fall considerably beneath consumers' wants. Should the weather prove fine during harvest work we may anticipate a better supply of malting parcels than was the case in 1850 or 1851. As regards oats, the produce will, we conceive, be rather in excess of last season. The fields generally show an abundant produce; but we regret to state that in most parts beans have suffered severely from blight, which attacked the bloom shortly after it made its appearance, and completely destroyed the prospects of the growers; hence many thousand acres of land have been ploughed up from the crop not being worth the expense of cutting and carrying. Peas are well spoken of with scarcely any exception—the late fine rains having materially added to the yield.

A few patches of land have been cleared of their oats in the West of England, as well as in Kent; and we understand that wheat harvest will be partially commenced in the Isle of Thanet on the 2nd of August; but it cannot be general for the next fortnight, or, perhaps, three weeks. In the neighbourhood of the metropolis the whole of the crop of hay has been secured in the best possible condition. Contrary to almost general expectation, its produce has turned out a fair average one, though, in our opinion, it has not equalled that of 1851, which, it will be recollected, was extremely abundant. It is probable, however, that the second cut will quite make up the deficiency observed up to the present time. In the Midland and Northern counties it will, doubtless, prove in excess of the Southern and Western districts, because cutting is always a fortnight or three weeks later than in the latter portions of the country. The stock of old hay having become much reduced higher prices have been obtained for it; whilst the value of straw, from the increased demand for thatching and other necessary purposes, has had an upward tendency.

As is always the case at this season of the year—

certainly ever since the severe losses sustained in 1847—numerous reports have got abroad to the effect that the potato disease has made some rather extensive ravages even upon the best lands. On this subject we have made the most careful inquiries, and the result is that, up to the present time, no losses worthy of notice have been sustained. True it is, that the disease is to be met with in some localities; but we have not the slightest hesitation in saying that the crop never presented a more promising appearance than during the whole of the month. From the continent the imports of new potatoes this season have been only about 2,000 tons, against fully 3,000 to 4,000 tons in 1850 and 1851; nevertheless, our markets have been very heavily supplied with home-grown qualities in the best possible condition, and which have sold at prices varying from 3s. 6d. to 7s. per cwt. —the latter figure being for kidneys.

The quantity of home-grown wheat now on hand is, perhaps, smaller than at any corresponding period during the last three years. This circumstance has had scarcely any effect upon the buyers, whose wants have been, and are likely to be, well met by the foreigner. The supplies of produce at this time in warehouse from the continent and elsewhere are very limited; but this is chiefly attributed to the anxiety manifested for some time past by the importers to sell on board, rather than incur the expenses of landing and warehousing. Should this system continue to be generally acted upon, we shall look in vain for any improvement in our quotations.

From Sussex and Kent our reports, in reference to the appearance of the hop bine, are favourable; but from Worcester we learn that the promise of a crop is a very moderate one. The bine has grown rapidly, and the duty has been estimated at £180,000, against only £75,000 at this time last year. All kinds of hops have met a very dull sale, and prices have ruled almost nominal.

The crop of seeds is likely to prove a good one. On the 26th transactions were reported in new rape seed, at Mark Lane, at £24 per last. Both carrots and turnips are looking remarkably healthy.

Although prices of live stock have been somewhat more remunerative, the supplies on offer in our leading markets have been far from extensive. The deficiencies in those of English beasts, sheep, and calves have been freely made good from abroad. The pastures being well covered, the supply of green food has continued large; hence the demand for cake has been trifling, notwithstanding the low prices at which it has been offered. Linseed has well maintained its previous value, although we learn that the Greek houses have sold not less than 200,000 quarters, to be shipped to England from the Black Sea, from May to October, at 40s. per quarter.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the imports of foreign stock have been on a liberal scale, the aggregate supplies of stock exhibited in Smithfield since we last wrote have been by no means large, the time of year considered; but their general quality has proved good. The "season" from Norfolk and Suffolk has now been concluded, whilst that from the northern districts has commenced, and from which upwards of 5,000 beasts have already come to hand. The hot weather having prevented the transmission of dead meat, the metropolis has been almost wholly supplied from the live cattle market; hence, the business doing has been somewhat extensive, and prices have been well supported. Amongst the outport arrivals has been one at Portsmouth of an entire cargo of oxen from Portugal. This importation has proved the best ever received; but, from the want of buyers at the above port, nearly the whole has been brought to London, and disposed of at comparatively high rates. Another cargo will shortly arrive on account of the same importers, who have paid £1,000 freight money for the two voyages. The experiment so often tried of endeavouring to fatten foreign stock in this country has been wholly abandoned; but we have noticed a decided improvement in the weighing qualities of the late arrivals, especially amongst the sheep, most of which now arrive hither with their tails cut. The following are the imports into London:—

	Head.
Beasts	3,613
Sheep	17,400
Lambs	2,555
Calves	2,157
Pigs	1,283
Total	27,008
Do in 1851	24,082

During the corresponding period in 1850, we received 16,089; in 1849, 16,412; and in 1848, 12,379 head.

The total supplies of stock exhibited in Smithfield have been as under:—

	Head.
Beasts	18,404
Cows	680
Sheep and lambs	160,190
Calves	3,746
Pigs	3,067

SUPPLIES AT CORRESPONDING PERIODS.

	July, 1847.	July, 1848.	July, 1849.	July, 1850.	July, 1851.
Beasts ..	15,773	16,878	15,576	16,741	18,492
Cows ..	586	495	470	451	470
Sheep and lambs .	153,290	147,290	162,900	178,550	188,170
Calves..	3,693	4,033	2,615	2,908	2,520
Pigs ..	2,228	2,350	2,044	2,168	2,800

The bullock supplies from the north have amounted to 5,900; from other parts of England, 5,800; and from Scotland, 1,050 head.

The prices of beef have ranged from 2s. 4d. to 3s. 10d.; mutton, 2s. 8d. to 4s.; lamb, 4s. 2d. to 5s. 2d.; veal, 2s. 6d. to 4s.; and pork, 2s. 6d. to 3s. 8d. per 8lbs. to sink the offals.

COMPARISON OF PRICES.

	July, 1848.		July, 1849.	
	s. d.	s. d.	s. d.	s. d.
Beef .. from	2 8 to	4 2	2 8 to	4 0
Mutton	3 8 to	5 0	3 0 to	4 0
Lamb	4 6 to	5 6	4 0 to	5 0
Veal.....	3 4 to	4 4	3 2 to	3 10
Pork	3 6 to	4 6	3 2 to	4 0

	July, 1850.		July, 1851.	
	s. d.	s. d.	s. d.	s. d.
Beef .. from	2 4 to	3 8	2 4 to	3 8
Mutton	2 10 to	4 0	2 6 to	3 10
Lamb	3 8 to	4 10	4 0 to	5 0
Veal.....	2 6 to	3 6	2 6 to	3 8
Pork	3 2 to	4 0	2 6 to	3 8

Newgate and Leadenhall markets have been very scantily supplied, whilst the demand has ruled steady, at full prices. Beef from 2s. 4d. to 3s. 4d.; mutton, 2s. 8d. to 3s. 10d.; lamb, 4s. 2d. to 5s.; veal, 2s. 8d. to 3s. 10d.; pork, 2s. 6d. to 3s. 6d. per 8lbs. by the carcass.

LIMERICK COUNTY.

The month of June and first week of July were so wet, as to cause the tillage farmer much anxiety and delay. The large quantity of rain that fell in June, and small amount of sunshine, were unprecedented for the season. We now have the long-wished-for summer weather, with heavy showers occasionally, and nothing seems the worse for the continuous rains of last month, and certainly grass has been much improved. The little injury that early potatoes have suffered was confined to those planted in sheltered gardens and deep rich soils. The samples that have been brought to market for the last week have not shown any disease, and the main crop is still in a healthy state. As might be expected, we had the potato blight alarm; but it was not like the regular disease, which is produced from atmospheric causes, and first attacks the leaves and stem, descending from them to the tuber; but in this case the root was first diseased, which makes it thought that excessive moisture was the cause. Many of the operations connected with green cropping have been retarded by the state of the weather, such as earthing potatoes, sowing turnips, cleaning mangolds, carrots, and parsnips, &c.; but all has now been put to rights, and no failure in them has been spoken of. The mower is hard at work, and more cannot be said for the weight of the crop than that it is good. Wheat, barley, and oats are all of full average promise. The grazing farmers are now beginning to fear that their profit on each animal will be light; there is so little difference between fat and lean stock in price.—July 17.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BERWICK FORTNIGHTLY MARKET.—There was but a small show of both cattle and sheep. The beasts, being of inferior quality, brought about 5s. 3d. per st.; mutton a shade more than 5d. per lb. There was a small show of lambs. The number of pigs was small; there being few buyers prices were rather lower. The following are the prices:—Beef, from 4s. to 5s. 3d. per st.; mutton 4½d. to 5d, lamb 6d. per lb.; pork 4s. 6d. per st. Fat beasts 10, lean do. 60, milch cows 10, sheep and lambs 508, and pigs 32.

DUNSE LAMB TRYST.—The supply of lambs at our tryst on Tuesday was larger than last year, and prices may be quoted as under:—Half-bred lambs from 13s. to 16s., three-parts bred from 15s. to 17s. 6d., and bred lambs from 17s. to 19s. 6d. There were two small lots which sold at 20s. The show of sheep was small, and sales from 21s. to 21s. 6d. for Dinmonts. Mutton sold from 4½d. to 5½d. per lb.; the demand great, and all sold off, averaging from 1s. to 1s. 6d. above last year's prices. In our wool market the demand was good, and a considerable quantity disposed of at the following prices:—All ewe clip from 24s. to 25s. 6d., mixed ewe and hogg from 26s. 6d. to 28s., do. all hogg clip from 29s. to 30s. per stone.

GLOUCESTER CHEESE AND WOOL MARKETS.—Although the election for the western division materially interfered with these markets on Monday last, yet they were tolerably well supplied and attended. Of cheese, about 100 tons were pitched, the whole of which was sold at the following prices:—Best singles 40s. to 44s., seconds 34s. to 37s., skim 21s. to 28s. per cwt. Of wool about 800 tods came to market, and the quality being superior the whole was disposed of early at from 28s. to 31s. per tod.

GLOUCESTER MONTHLY MARKET was indifferently supplied with beef; the trade was steady at from 5d. to 5½d. per lb. The few sheep penned sold readily at from 5¼d. to 5¾d. per lb., and a perfect clearance was effected. Lambs, of which there was a limited supply, sold well at from 6d. to 6½d. per lb., and at an early hour the whole of the stock was disposed of.

HORSHAM LAMB FAIR.—This fair was not so numerously attended as last year, but nearly the whole of the lambs penned (about 13,000 in number) were sold at from 16s. to 26s. There was about the usual number of horses in the fair, but not a great many changed hands. Pigs were tolerably cheap, and moved off pretty freely. Good mutton, fit for the butcher, made about 4s. per stone.

JEDBURGH FAIR.—A good deal of business was done in wool, on terms similar to St. Boswell's and other recent wool markets.

KIRTON LINDSEY FAIR was more numerously attended than was anticipated. Good horses and useful nags were in great request, but of each there was but a moderate show. Several lots of ponies (principally Irish) met a very brisk sale, and a great many changed hands at prices varying from £8 to £9, £16 being paid for the better sort. A great quantity of inferior horses on sale, the demand for which was very limited. With beasts we were only thinly supplied, and but little business was transacted.

NEWARK FAT STOCK MARKET was very moderately supplied with stock. Buyers seemed somewhat indifferent to pay the demanded price, and sellers were obliged to submit to a reduction both in beef and mutton. Mutton sold at 4½d. to 5d. per lb. Beef 5s. 6d. per stone. At market, beasts 103, sheep 811.

SHERBORNE FAIR was very thinly attended and sup-

plied. The number of sheep penned was much below the usual average, and the sale was not so brisk as at the late Yeovil fair by about 1s. per head. Ewes fetched from 25s. to 30s.; wethers, 22s. to 28s.; lambs, 17s. to 21s. each. The quantity of cow stock offered was more than the demand required, which caused the trade to be dull, and only a few of those of the best quality found purchasers. Fat beef realised from 6s. to 9s. per score; mutton, 5d. to 6d. per lb.; pork, 7s. to 7s. 6d. per score. There was a large quantity of pigs penned, but the trade was dull, and lots of them were driven away unsold. The horse fair was very well supplied with numbers, but the quality of the animals was mostly of a very rough description, and only a few of the very best found purchasers. The wool trade was brisk, and a great many staplers were present, who bought at from 13½d. to 15d. per lb.

ST. BOSWELL'S LAMB FAIR.—It is admitted by all parties to be the most important market in the south of Scotland for this description of stock. Business commenced at a very early hour, the stock being placed before daylight. The stock was about an average in point of numbers, and the quality was very superior. The buyers were numerous, from all parts of the country, and many, both Irish and English gentlemen and dealers, left the market unserved—we believe some of them intended to buy large numbers, more particularly for Ireland. The sales effected in the earlier part of the morning brought, for a few of the better lots, about 2s. a-head more than at this market last year; but the inferior kinds of this stock fetched from 1s. to 1s. 6d. a-head higher. This extraordinary demand for sheep is caused by the abundant keep on the country at present, and every prospect of the turnip crop being a favourable result; also the prospect of the wool market rising. After the first break on the sales, the stock went off rapidly. For a time there was an apparent unwillingness to give prices, but the holders of stock having discovered they were getting things their own way, were, in the early part of the forenoon, more communicative. Several sales were effected on Saturday night, but the prices in these instances were to be referred to the rate of the market. The Edinburgh and Glasgow salesmen appeared very active, and we understand that one of them purchased about 1,300 head, principally for the north and Fifeshire. By eleven o'clock in the forenoon it was supposed there was not a beast remained unsold. There were also a good number of clipped hoggs on the market-stance, for which there was a good demand; for the inferior qualities of which 1s. a-head was obtained above last year, and the better kinds in the same proportion. Gimmers ran from 21s. 6d. to 23s., and diumonts from 25s. 6d. to 29s. Such a complete clearance has not been seen at St. Boswell's for many years.

OVERTON FAIR.—There was a good average number of sheep (about 100,000 head). Generally speaking, the stock, as regards condition, was not quite so good as on several preceding years; notwithstanding this, there was a good demand at an advance of about 1s. on the prices of this time twelvemonth. There was a large attendance of dealers, who were anxious to purchase, and consequently, notwithstanding the high prices demanded, but very few pens did not change hands. Mr. Cozens, of Norton Farm, penned 200 very superior ewes, which realized about 35s. Some lambs sold at 27s., and one lot as high as 31s. The prizes were awarded by Messrs. John Twynam, William Snuggs, and John Lunn, as follows:—Class 1.—A cup of ten guineas value, given by the Right Hon. Sir Francis Thornhill Baring, Bart, for the best 100 Hampshire down wether lambs, from a flock of any number, fed and bred by the exhibiter; Mr. F. Budd, Hatch Warren farm. Class 2.—A cup of ten guineas value, given by Melville Portal, Esq., M.P., for the best 100 ewes, full-mouthed, the whole of which have been fed by the exhibiter since the 15th Oct., 1851, on land in his own occupation; Mr. F. Budd, Hatch Warren farm. Class 3.—A cup of ten guineas value, given by William Beach, Esq., for the best 80 wether lambs, bred from a flock of ewes not exceeding 410; Mr. Davis, North Waltham. Class 4.—A cup of five guineas value, given by the Right Hon. C. S. Lefevre, M.P., for the best pen of ram lambs, of any breed, not less than four; Mr. C. Edney, Whitchurch. The lambs shown by Mr. Penn, of Itchen Stoke, were highly commended.

STOCKBRIDGE SHEEP AND LAMB FAIR.—About an average number were penned. Business commenced very sluggishly owing to the high prices asked by the sellers, who, eventually acceding to more reasonable terms, the dealers purchased slowly at an advance of 1s. per head on ewes and lambs, but wether sheep did not partake of this improvement. Several farmers did not feel disposed to meet the offers of their customers, and took their flocks back to await the issue of Overton and Alresford fairs. There was a much shorter attendance of company than usual, which may in part be attributed to the excessive and overpowering heat of the weather. Several pens of fine rams were exhibited, amongst which we noticed those of Messrs. J. Paine, Courtney, Spencer, T. Pain, Dear, &c., &c. Prices: ewes from 26s. to 30s., lambs from 18s. to 24s., (one superior lot, belonging to Mr. W. Attwood, realized 27s.), wethers 26s. to 35s.

SWAFFHAM (NORFOLK) FAIR.—There was a good supply of live stock of every description, with an active demand throughout the day, grazing beasts fully supporting former rates. The supply of sheep was unusually short. The top lots of wethers were eagerly sought after; high prices were demanded, and, as the day waned, so far from sellers having to lower their pretensions, the contrary was the case. There was likewise a brisk trade for strong useful ewes. Prices ranging from 28s. to 34s. each; wether lambs, 18s. to 22s.; ewe, 15s. to 18s. each. Milch and in-calf cows were easier to buy. Horses: really good ones kept up in prices; inferior ones scarcely saleable, but colts in good demand, 3 year olds selling freely, at 25*l.* to 35*l.*; 2 years old, at 18*l.* to 25*l.* each.

IRISH FAIRS.—LISBURN: Taken altogether, the amount of stock offered was, perhaps, the largest shown in that town for several years past. In the cow fair great activity prevailed, especially as to fat stock, which sold at prices that must have proved very favourable to holders, even taking into account the high figure paid for such cattle at May. One grazier sold ten head of three-year-old heifers, in good condition, at one hundred guineas; another disposed of eight head, at £76; two very fine Durhams brought £25; and a handsome Ayrshire, eighteen months old, sold for £9. Springers were in better demand, the prices realized being about £1 per head above the current rates of similar cattle four weeks since. Cows in milk were also more readily disposed of, the turn in the value of butter having caused more inquiry for such animals, with a slight advance in prices, equal to the depreciation which took place in the prices of milch cattle during the last six weeks. Young stock, well bred and with improvable appearance, were bought up by the dealers connected with the English markets, at the full rates current since April last. There were several lots of inferior cows, aged and in bad condition. These sold at very low prices. Sheep nearly finished were very difficult to purchase; the supply of all descriptions was ample, but the quality offered shows that much yet remains to be done by farmers in order to bring up the breed of this valuable class of farm stock in this part of the country. Lambs were fully six shillings a-head above the rates current two years ago. Store pigs were much wanted, but the supply was very short in proportion to the demand; those offered exhibited a marked improvement in the breed, and brought large prices. Suckers sold at various rates —25s. to 35s. per pair. The horse fair showed a more than usual number of animals, with some very superior descriptions both for saddle and harness. A jockey, from Wales, bought six up-sized bay horses, at £200 for the lot; a pair of iron-greys, matches, went off at £70. Roadsters were in demand, at 12 guineas to 18 guineas each. Farm horses brought £14 to £16. Hacks, £6 to £10. About a dozen horses—four or five year olds, up to heavy weight, and likely to answer the troop—sold at prices from £20 to £25 each. Of the very inferior hacks and screws, little need be said beyond the fact that they were numerous, and brought from £2 to £6.

WOOL MARKETS AND FAIRS.

DEVIZES WOOL FAIR was largely attended by both buyers and sellers, and a good business was done at the following rates:—Ewe wool, 29s. to 30s. 6d.; ewe and teg mixed, 32s. to 34s.; one lot, which was five-sixth teg and one ewe, fetched 34s. 6d. There was but little teg in the fair, and we heard of none being sold. The whole number of fleeces offered was 33,000.

DORCHESTER WOOL FAIR.—As several recently established fairs had lately been held, it was feared that a considerable diminution would have been apparent both as regards

the quantity of wool pitched, and in the number of purchosers ; but we are pleased to state that, not only was there a larger quantity of wool (upwards of 2,000 tods) offered for sale than on the preceding year, but that the whole of it met with ready buyers, at the following prices:—Ewe wool, 28s. to 30s.; mixed do., 29s. to 31s.; teg do., 33s. to 34s. per tod.

FORT-WILLIAM WOOL FAIR, Tuesday, July 13.—The attendance was numerous, but less than on some former occasions. In addition to transactions in blackfaced, several lots of Cheviot sheep were disposed of, as were also many clips of Cheviot wool. Sellers were very much indisposed to commence business, and until a late hour in the evening a stiff market was expected. The particulars of a single transaction in wool were not to be ascertained until after eight o'clock, at which hour purchases may be said to have commenced. The difficulty of obtaining *bona fide* prices at the Fort-William fair is perhaps unequalled at any other market in the kingdom; and in proof of this statement we may mention that in some instances promises of secresy were exacted before finally concluding the bargain. In cross and Cheviot sheep a slight rise on last year's prices was obtained—estimated by dealers to average about 6d. per head, and all the lots of this description were said to have been sold. Blackfaced lambs varied very little, if anything, from the rates of 1851. Purchasers of wool consider that last year's prices were barely supported, and in a few cases lower quotations must be given. The best and largest clips sold at from 9s. to 9s. 3d., rumour says up to 9s. 6d. per stone, although we only heard of one actual transaction at that price; inferior and small clips were sold at 8s. 6d. to 8s. 9d. and 9s. per stone.—*Inverness Courier.*

GLENDEVON WOOL MARKET. — A considerable number of buyers and growers were in attendance. The buyers were Messrs. Scott and Murdoch, Perth; Buchanan, of Bannockburn; Younger, of Glasgow; and others. The day was considerably advanced and before much business was done, but before evening a great portion of the wool was disposed of at 9s. 6d. laid, and 12s. 6d. white, all blackfaced or 22s. the double stone.

HULL, July 20.—About fifty sheets of wool were shown, and nearly all sold at about previous prices.

LLANDRILLO WOOL FAIR.—Farmers brought wool to the village beyond every expectation for the first time from distant places, and were met with plenty of buyers, who soon cleared the street, with the exception of a few lots, and those were sold after the wool went home. The price was from 10d. to 12d. per lb. The largest purchasers were from Llangollen and Glyncciriog, who bought a great many tons.

YORK, July 22.—At this our tenth market for this year's clip we had about 384 sheets of wool; about 320 were sold, and about 64 left on hand. We had again a slow business market, the buyers trying to reduce prices, and the sellers successfully resisting the attempt. First-class wools, of super quality and clean condition, had the call of the market, at prices firm upon former quotations, whilst secondary kinds, in dirty condition, were difficult to sell, at prices tending downwards. Locks and cotted fleeces were in good demand, at former quotations. The high prices demanded to-day by the sellers of moor wools have been resisted by the buyers. Clips bought at Castleton fair on Monday last at 9s. 6d. per stone would not realise more than 9s. in the York market; consequently the dealers lost fully 6d. per stone, besides carriage and expenses. The quotations at Liverpool for Alpaca and East India wools, and also the price of Scotch wools, tended to bring down the York prices for the moor wools.

REVIEW OF THE CORN TRADE
DURING THE MONTH OF JULY.

The splendid weather with which we have been favoured throughout the month now about to terminate has wrought a wonderful change in public opinion in regard to the probable result of the ensuing harvest. When we last addressed our readers, the prospects were certainly not of a character to warrant very high expectations; to nearly the end of June there was a great want of sunshine, and more rain fell in that month than was deemed desirable; since then, however, we have had several weeks of intense heat, and with the exception of partial thunder showers little rain; the various crops have, consequently, been forced rapidly forward, and at present there is reason to believe that the harvest will prove superior both in quantity and quality to the average of good seasons. The blooming time passed over favourably, and we have hitherto heard of very few complaints of disease of any sort. The wheat crop is now rapidly approaching maturity; the colour is good, the ear long and well filled, and the straw clean and long. All that will be needed, therefore, is fine weather for the in-gathering, but heavy and continued rains might do much harm even now. The heat has, in some instances, been perhaps too great for Lent-sown corn, but the reports from the agricultural districts, on the whole, speak well of barley, oats, and peas, but the beans are not so favourably spoken of.

The potato disease prevails to a greater or less extent on this side of the Channel, as well as in Ireland; indeed the accounts from the latter country were at one period of a nature to cause considerable uneasiness, but the disorder does not appear to have spread so rapidly as it was feared it might do, and apprehension on the subject has, in a great measure, subsided.

At the moment, and for some weeks past, the most sanguine anticipations of the probable result of the crops have been indulged in; we need, however, scarcely remind our friends that much must yet depend on the weather. Meanwhile there is an evident disposition on the part of those holding stocks to clear out as far and as fast as is practicable in expectation of a low range of prices after harvest. That the value of all kinds of agricultural produce would be likely to rule very low in case the present promise of future abundance should be fulfilled cannot be questioned. With good average crops, the produce of Great Britain is, in our opinion, nearly, if not quite, sufficient for the consumption; with plentiful harvests it was so fifteen or sixteen years ago, as was proved in 1835 and 1836, when scarcely any importations were needed. Against the increase which has since taken place in the population, we have the various improvements which have been introduced in agriculture; the latter will, we think, be found to have enabled

farmers to increase their produce so as fully to provide for the increase of population. Should the home crops, therefore, give only an average yield, and no deficiency occur in the produce of the other corn-growing countries of Europe and America, we should in all probability have lower prices during the twelve months, commencing with the 1st September next, than we have witnessed for many years. Six years' trial of free trade has proved that the foreign growers can, whatever may be the character of the seasons, always produce wheat in sufficient quantities to furnish England with considerable supplies; this year the prospects for the harvest on the continent of Europe are as favourable as in this country; it follows, therefore, that there will be a large excess for shipment, and unless anything unforeseen should hereafter occur to give a different complexion to affairs, we must make up our minds to overwhelming imports of grain when little or no foreign aid is likely to be needed. The idea of a re-imposition of a duty on corn appears to have been wholly abandoned by both sides of the House of Commons, but that it will be absolutely necessary to place the farmers of Great Britain in a position to enable them to cultivate the soil with some profit, or that land must ultimately go out of cultivation, appears to us inevitable. Lord Derby's party claim having gained a majority by the general election; it remains now to be seen what they will propose for the relief of those who have contributed to place them in that position. The question resolves itself into this, Can wheat be grown in this country with profit at 35s. to 40s. per qr.? A higher price cannot, on the average of years, be calculated on with free trade. With rents, &c., as they now are, the question admits, we believe, of no answer except in the negative. What can be done, then, to lower the cost of production? This is the matter which the new Government will have to consider. With this simple statement we shall dismiss the subject for the present.

Harvest operations have been partially commenced in some early localities—some barley, rye, oats, and peas having been cut during the week; and should the weather be favourable, reaping is likely to be pretty general in the southern parts of the kingdom in the course of eight or ten days.

The hay crop has been secured in a very satisfactory manner. Mowing was scarcely commenced until the beginning of July, which is considerably later than usual; but the work proceeded rapidly, and nearly the whole of the produce has been carted in excellent order. The yield has turned out much better than (considering the long-continued drought in April and May) could have been expected, and the quality is very good. Farmers have been so busy with their hay crops as to allow of little leisure for bringing forward supplies of corn. The elections have also interfered more or less with the regular course of business, and the consequence has been that the deliveries of grain from the growers have been exceedingly short during the month now about to terminate. This has prevented prices giving way so much as they otherwise might have done, still the tendency has been decidedly downwards at all the leading markets in the agricultural districts as well as at the principal consuming towns. To show how great has been the falling off in the home supplies, we beg to call attention to the following account of the quantities of English wheat sold during the last four weeks at the towns from which the returns are made for compiling the averages:—

Week ending	26 June....	104,174 qrs.
,,	3 July	91,665 ,,
,,	10 ,, ...	79,471 ,,
,,	17 ,, ...	59,653 ,,

From this statement it would appear that the stocks of wheat of last year's growth are nearly exhausted; but we think this conclusion would not be correct, feeling convinced that the falling off has been occasioned, at least in a measure, by the causes above referred to. Admitting, however, that less wheat of home-growth than usual remains in the hands of farmers, there seems little probability of anything like scarcity being experienced, the supplies from abroad having thus far been always in excess of the demand.

Within the last fortnight large arrivals of wheat and Indian corn have taken place off the coast from the Black Sea and Mediterranean; and, for a considerable time past, we have had regular weekly receipts of flour at Liverpool, London, &c., from America.

The supplies from the near continental ports have not been so liberal; but prices are rapidly giving way on the other side, and it is more than probable that the Baltic merchants will send the stocks they have so long withheld in expectation of an English demand to this country, now that the prospects for the harvest have deprived them of the hope of higher prices.

Business at Mark Lane has been exceedingly dull throughout the month, and the fall in the value of wheat may be estimated at 2s. to 3s. per qr.

The arrivals coastwise into the port of London have been scanty in the extreme, or the decline would probably have been greater. The weekly receipts have scarcely averaged 3,000 qrs., and the quantity brought forward by land-carriage samples from the neighbouring counties has been equally unimportant; still, as already remarked, buyers have managed to obtain the advantage. The decline has been as follows: On the 5th

instant the millers refused to buy until factors submitted to a reduction of 1s. to 2s. per qr., and even at that abatement the demand was by no means active. During the succeeding week, the depression rather increased, and on the 12th a further fall of about 1s. per qr. occurred. Since, then, however, factors have manifested a determination to make a stand; and the few small lots exhibited from Essex and Kent on the following Monday (19th inst.) were placed without further concession being made. This was also the case on the 26th July, though the millers conducted their operations with more than ordinary caution. Good runs of Kentish and Essex red wheat are not now worth more than 40s. per qr.; and it has become difficult to exceed 48s. per qr. for white, though extra fine qualities of either would perhaps sell at 1s. per qr. over the rates named.

The arrivals of foreign wheat into London have not been particularly large; still, 50,000 qrs. have come to hand in the space of four weeks, which, under existing circumstances, has proved more than has been needed. A considerable portion of the supply has consisted of secondary and inferior qualities of Baltic wheat, shipped from Holland. No quotable change took place in prices during the first fortnight; but the turn was, nevertheless, decidedly in favour of the purchaser: but since then, a decline of fully 2s. per qr. has been generally submitted to, without inducing purchasers to act freely. Some of the inferior Lower Baltic red wheat has lately been forced off at the low price of 35s. per qr., and other sorts have been sold at corresponding rates. The loss to the parties concerned must be enormous, as some of this wheat has been bought at Rotterdam and Amsterdam, at very high rates, to ship to London. The stocks in granary have rather accumulated since our last; still, the total quantity in warehouse is not particularly large. A considerable amount of business has been transacted during the month in floating cargoes; and of the sixty or seventy vessels, wheat-laden, which have arrived from the Mediterranean and Black Sea off Falmouth and Queenstown for orders, more than half had been sold before arrival; and at present there are scarcely a score remaining unsold. The best qualities of Ghirka have realized 38s. to 39s., and Polish Odessa 35s. to 36s. per qr., cost, freight, and insurance. These rates are, however, no longer obtainable; and sellers having refused to give way sufficiently in price to tempt buyers, comparatively few bargains have been closed during the last eight or ten days. We have lately had offers of wheat free on board at Baltic ports, at moderate terms, without leading to business, there being at the moment a decided unwillingness to enter into forward purchases. Very fair qualities of red, weighing 61 to 61½lbs. per bushel, might be bought at 38s. per qr., including freight and insurance, and higher kinds at corresponding rates.

The top quotation of town-manufactured flour has remained stationary, but the sale has been languid in the extreme. Country flour has in some cases been offered at reduced prices, without inducing the bakers to take more than they have needed for immediate use. That the consumption of bread has been much decreased by the abundance and cheapness of all kinds of vegetables, cannot be questioned; and in many parts of London the bakers have been offering *stale* bread at 2d. per 4lb. loaf. The arrivals of flour from France have not been large, but from America 58,000 barrels have been received. Both kinds have been exceedingly difficult of disposal, and importers have been forced to store for want of buyers from on board ship. The common sorts of French have been offered at about 28s., and very good at 30s. to 32s. per sack; whilst American in good condition may be quoted 20s. to 21s., and fine 22s. per barrel, with more sellers than buyers at the terms named.

Hardly any barley of home growth has come forward; and in the absence of supply quotations have become in a great measure nominal. Stocks of English barley are certainly reduced into a very narrow compass; but as the finer sorts for malting are not required at this season of the year, and the foreign supplies have proved amply sufficient to furnish what has been needed for feeding purposes, the value of the latter has tended downwards. Light grinding qualities from France and Belgium have been sold at 23s. 6d. to 24s. 6d., and heavy Baltic samples at 25s. to 26s. per qr. One sample of new Kent barley was exhibited on the 26th inst., not by any means fine, the berry being small and the colour far from bright; for this parcel 36s. per qr. was asked, a price much above the notion of buyers, and it consequently remained unsold. The quality of a single sample secured too early, and probably in an immature state, can afford no criterion for forming an opinion as to what the growth of this year may prove. The accounts, thus far, speak very favourably of this crop, and we are disposed to think that the quality will in general be fine.

Malt has moved off very slowly, and though sellers have not conceded freely, they have been compelled to give way more or less. The hot weather has no doubt promoted the consumption of beer, and the stocks of old malt have been considerably diminished.

The supplies of oats of home growth have been scanty. This fact tends to confirm all that has

been said earlier in the season respecting the exhaustion of the old stocks in the agricultural districts. The receipts from abroad have, however, been so liberal, that the scarcity of the home supplies has not been felt; indeed, there has been a constant excess of supply over demand, and prices have given way from week to week. The first arrival from Archangel appeared in the market on the 23rd inst. Since then several cargoes have arrived. The quality of the Russian oats, the growth of 1851, is quite equal to that of average years, and we should judge the weight, by the samples we have seen, at 38 to 39lbs. per bushel. The opening price was 19s. Afterwards sales were made at 18s. 6d. and 18s. per qr., and with increased receipts the price will probably go down to 17s. per qr., a rate which will barely get importers out without loss. Fresh English oats have, owing to their scarcity, brought relatively higher prices, and 40 to 42lbs. feed are still worth 20s. to 21s. per qr. Scotch feed, of superior quality, may be quoted 22s. to 24s., and good Irish 19s. to 20s. per qr. Danish and Swedish oats are worth at present from 17s. to 19s. per qr., according to quality. The forthcoming crop is well spoken of, on this side of the channel as well as in Ireland; and if the harvest should be well secured, the rates above named would probably not be supported.

The rise which took place in the value of beans in June, owing to reported blight in the growing crop, has not been maintained. This, however, has not been caused by a more favourable estimate having been formed of the probable yield, but by larger importations of foreign than had been calculated on. The reaction from the highest point has been about 2s. per qr., and within the last week or two the sale has become very difficult.

Peas have also declined in price, notwithstanding the belief that the effect of the very great heat which we have experienced will be a short produce. One sample of new white peas was exhibited at Mark Lane on Monday, the 26th. The condition was remarkably good, and the only fault found was that the peas were small. The top price for English boilers does not now exceed 30s. per qr., and foreign may be bought several shillings lower. The arrivals from abroad have been liberal, to which the downward movement in prices must be in a great measure attributed.

There has been a good steady demand for Indian corn afloat on Irish account, and nearly all the cargoes which have arrived off the coast have been taken for that destination at prices very little below those previously current. This article is now essential to the population of Ireland, and the consumption seems likely to increase from year to year. Latterly the supply has been somewhat in excess of the demand, and the tendency of prices has, the last week or so, been downwards; Galatz and Odessa, arrived off the coast, having been offered at 29s. to 29s. 6d. per qr. The advices from abroad do not enter into very minute details respecting the prospects for the ensuing harvest, a proof that no cause for complaint exists. Many of the foreign merchants still hold stocks of old wheat, and anything likely to raise prices would be eagerly circulated. Our own impression is that the harvest all over Europe will turn out abundant in case the month of August should prove moderately propitious. In the south a considerable proportion of the corn has already been secured, and nothing is heard of any deficiency of yield.

In the countries bordered by the Baltic, rye (a very important crop in that quarter) is now being harvested, and there are no complaints; our conclusion that there is no cause to apprehend a deficiency is therefore, we think, tolerably safe. So long as there was any chance of Great Britain requiring to import, holders on the other side remained very firm; but latterly they have lost confidence, and the most recent advices state that prices of wheat were giving way. Even at Danzig, where stocks are in very firm hands, this has been the case; but quotations in that quarter are thus far relatively higher than in this country, and comparatively little wheat has yet been shipped from thence to Great Britain. Advices dated 20th July state that about 4,000 qrs. had changed hands in the preceding week; for 61 to 62lbs. Lower Polish high mixed equal to 39s. had been paid, and 59 to 61lbs. inland had been sold at 35s. to 36s. per qr. free on board. Freight to London was 2s. 6d. per qr. for wheat, and vessels were offering on corresponding terms to other parts of the United Kingdom. The most recent advices from Stettin inform us that a portion of the rye crop in that quarter had been secured in good condition, and that wheat harvest would be general before the close of the month. On the 23rd inst. good red Stettin wheat, weighing 60 to 61lbs., was quoted 33s. to 34s., and fine Pomeranian and Ukermark, of 61 to 62lbs. weight, 34s. to 35s. per qr. free on board. Rye was then obtainable at 22s. to 23s. per qr. Freight to London was 2s. 3d. per qr. for wheat. From Rostock we learn that quotations had become nearly nominal, holders having refused to give way sufficiently to allow of any business of importance being done. The crops in that neighbourhood were progressing favourably towards maturity, and would, it was thought, give a good return. The stocks of old wheat remaining at Rostock are said not to be large, but we feel disposed to think that shipments to some extent will be made from thence, so soon as the result of the harvest shall have be-

come known; at present good qualities could not be bought there free on board below 36s. per qr., which would bring the cost here too high to allow of a profit being realized in our markets.

At the near continental ports, the dull accounts from hence have had their usual influence; and from Hamburg we learn, that though the weather had become unsettled the downward movement in prices had not been checked, wheat being 1s. to 1s. 6d. per qr. lower on Tuesday (the 23rd) than on that day week. Ordinary 59lbs. Holstein had been offered at 32s. 6d. to 33s. per qr., free on board, without exciting attention. Spring corn had also become difficult of sale; and both barley and oats had been offered at reduced terms without meeting with attention.

From Holland and Belgium, the reports respecting the probable result of the harvest are favourable, and the crops are also said to promise well in the Rhenish provinces.

From France the accounts are of a somewhat contradictory nature. The heat in that country has been intense, and thunder-storms have been very frequent; these have done a good deal of damage in particular localities, but in other parts the grain crops will give a large return, and on the whole the advices lead us to believe that wheat will produce well in quantity and be of fine quality. Flour declined in price at Paris the first two or three weeks in July, but latterly holders have manifested less anxiety to realize. A letter from Nantes, dated 23rd inst., informs us that the cutting of barley, rye, and oats had made considerable progress, and that the wheat harvest had been commenced in the Lower Loire.

In the southern parts of Europe, harvest is fast drawing to a close, but we do not as yet hear much respecting the result, which augurs well, as complaints, where cause exists, generally travels fast.

In Southern Russia and the Danube provinces the prospects for the harvest were, according to the latest accounts, described as promising; and at Odessa, &c., prices of wheat were tending downwards.

We have advices of recent dates from America; the reports from thence respecting the prospects of the harvest are, on the whole, of a favourable nature; but some mischief had, it appears, been done to the crops by violent thunder-storms, which circumstance had assisted to maintain the confidence of holders of flour. The stocks at the principal shipping ports on the coast were not in general heavy; and the supplies from the interior having been only moderate, whilst a steady shipping demand had been experienced, prices had not only been well suppported, but the tendency had on the whole been rather upwards. At New York, on the 13th July, good shipping brands were quoted 18s. 4d., Ohio and Michigan 18s. 8d. to 19s. 2d., and pure Genessee 20s. 3d. to 21s. 3d. per brl., free on board.

The exports of bread stuffs from the United States from Sept., 1851, to the middle of July, had been as follows:—

Flour.	Wheat.	Indian Corn.
brls.	bush.	bush.
1,208,668	2,198,167	1,498,204

Freight was then 11d. to 1s. 1d. per brl. for flour to Liverpool, 1s. 6d. to 1s. 9d. to London, and 1s. 6d. to Glasgow.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.			
Wheat, Essex and Kent, white	38	to 42	fine	up to 49
Ditto ditto old	38	42	„	49
Ditto ditto red, new	36	38	„	40
Ditto ditto old	36	38	„	41
Norfolk, Lincoln, & Yorksh., red	37	39	„	40
Ditto ditto old,	none		„	—
Ditto ditto white new	40	42	„	45
Ditto ditto old	none		„	—
Barley, malting, new		28		31
Chevalier		31		32
Distilling		26		28
Grinding		25		27
Malt, Essex, Norfolk, and Suffolk, new	51	53	extra	58
Ditto ditto old	43	46	„	49
Kingston, Ware, and town made, new	57	58	„	60
Ditto ditto old	48	51	„	53
Oats, English feed		17	19 fine	21
Ditto Potato		20	22 extra	24
Scotch feed		20	22 fine	24
Ditto Potato		22	24 fine	25
Irish feed, white		16	18 fine	20
Ditto, black		16	18 fine	19
Rye		27	29 old	27 29
Beans, Mazagan		30	31 „	31 32
Ticks		31	32 „	32 33
Harrow		31	33 „	32 34
Pigeon		34	35 „	36 37
Peas, white boilers		34	37 „	34 37
Maple		32	34 „	32 34
Grey		30	32 „	32 34
Flour, town made, per sack of 280 lbs.	—	—	„	35 40
Town and Country Households	—	—	„	33 35
Norfolk and Suffolk, ex-ship	—	—	„	28 30

FOREIGN GRAIN.

	Shillings per Quarter.					
Wheat, Dantzic, mixed	39	to 40	high mixed	42	44	extra 50
Konigsberg	38	40	„	41	42	„ 44
Rostock, new	38	39	fine old	40	42	„ 44
Pomera., Meckbg., and Uckermk., red		36		37	extra 39	42
Silesian		„ 36		37	white 39	41
Danish and Holstein		„ 34		36	„ 36	38
Rhine and Belgium		„ 36		38	old 38	40
French		„ 34		36	white 36	40
Odessa, St. Petersburg and Riga		30		32	fine 34	36
Barley, grinding					24	26
Distilling					26	28
Malting				none	—	—
Oats, Dutch, brew, and Polands					18	20
Feed					17	18
Danish and Swedish feed					17	19
Stralsund					18	20
Russian					17	19
French					17	19
Beans, Friesland and Holstein	27	30	Konigsberg		32	34
Peas, feeding	29	31	fine boilers		33	35
Indian Corn, white	27	29	yellow		27	30
Flour, French, per sack	27	31	fine		32	34
American, sour per barrel	17	18	sweet		19	21

IMPERIAL AVERAGES.

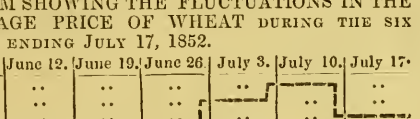
For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
June 12, 1852..	40	11	27	6	20	0	29	8	31	10	31	2
June 19, 1852..	40	9	27	5	20	2	30	7	32	0	31	9
June 26, 1852..	40	10	27	6	20	0	31	0	32	4	31	9
July 3, 1852..	41	4	27	5	19	10	32	4	33	1	33	2
July 10, 1852..	41	5	28	3	19	9	32	6	34	0	33	3
July 17, 1852..	41	0	27	0	19	11	30	1	34	5	30	11
Aggregate average of last six weeks	41	0	27	6	19	11	31	0	32	11	32	0
Comparative avge. same time last year	42	0	25	1	21	8	28	6	31	6	28	6
Duties.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1851.	Qrs.	Av. s.	d.
Wheat....	59,653 ..	41	0	Wheat....	51,264 ..	42	7
Barley....	1,946 ..	27	0	Barley....	1,807 ..	25	6
Oats	7,528 ..	19	11	Oats	6,259 ..	21	11
Rye.....	68 ..	30	1	Rye.....	87 ..	28	2
Beans....	2,677 ..	34	5	Beans	1,813 ..	31	5
Peas	323 ..	30	11	Peas	340 ..	28	6

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT during the six weeks ending July 17, 1852.



An Account shewing the Quantities of Corn, Grain, Meal, and Flour, imported into the United Kingdom in the month ended 5th July, 1852, the Quantities upon which Duties have been paid for Home Consumption during the same month, and the Quantities remaining in Warehouse at the close thereof.

Specie Grain.	Quantity imported.	Quantity entered for consumption.	Quantity remaining in warehouse.
Wheat, from British Possessions	qrs. bush. 3460 7	qrs. bush. 3468 7	qrs. bush. 1 2
Barley, do.	—	—	—
Oats, do.	280 0	280 0	—
Peas, do.	1900 4	1900 4	—
Maize or Indian Corn, do.	1 1	1 1	—
Wheat, foreign	216161 3	216261 3	3679 7
Barley, do.	45581 1	45581 1	15 5
Oats, do.	90000 3	90000 3	24 0
Rye	1151 5	1151 5	—
Peas, do.	4426 6	4426 6	—
Beans, do.	16429 0	16429 0	1797 5
Maize or Indian Corn, do	110135 6	110135 6	—
Buckwheat	1103 0	1103 0	—
Malt	—	—	—
Beer or Bigg	—	—	—
Flour from British Possessions	cwts. qrs. lbs. 61989 0 14	cwts. qrs. lbs. 61989 0 14	cwts. qrs. lbs. 6 3 18
Flour, foreign	375484 3 22	375484 3 22	7 2 26

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 50s. to 55s.; crushing 45s. to 48s.
Linseed Cakes (per ton) ..... £8 0s. to £8 10s.
Rapeseed (per last) new £22 to £24 ..... old £21 to £23
Ditto Cake (per ton) ..... £4 5s. to £4 10s.
Mustard (per bushel) .... white 5s. to 6s.; brown, 7s. to 9s.
Coriander (per cwt.)..... new 11s. to 13s., old 10s. to 12s.
Canary (per cwt.) ..... 40s. to 44s.
Tares, Winter, 28s. to 30s. p. qr.; Spring, 3s. 6d. to 4s. p. bush.
Carraway (per cwt.)..... 33s. to 34s.; fine 36s.
Turnip, white (per bush.)..... Swede (nominal).
Cloverseed (per cwt.)..... red 40s. to 44s., fine 48s. to 50s.

FOREIGN SEEDS, &c.

Clover, red (duty 5s. per cwt.) 38s. to 44s. per cwt., super. 48s.
Ditto, white (duty 5s. per cwt.) ..... 38s. to 46s. per cwt.
Linseed (per qr.).... Baltic, 43s. to 46s.; Odessa, 44s. to 47s.
Linseed Cake (per ton) ..... £7 to £9 10s. 0s.
Rape Cake (per ton)..... £4 5s. to £4 10s.
Hempseed, small, (per qr.) 38s. to 42s., Do. Dutch, 44s. to 46s.
Tares (per qr.) ..... small 28s. to 30s., large 30s. to 32s.
Rye Grass (per qr.) ..... 28s. to 35s.
Coriander (per cwt.) ..... 10s. to 13s.

HOP MARKET.

BOROUGH, Monday, July 26.

The demand for Hops is rather limited, but quotations are not lower for the finest samples. The plantation accounts continue favourable. Frederick Horton.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	*Cheese, per cwt.*	s.	s.
Friesland	64 to	68	*Cheshire*	50 to	70
Kiel	64	66	*Cheddar*	56	68
Dorset ..... *new*	70	76	*Double Gloucester.*	46	56
Carlow ..... „	—	70	*Single do.* ..	42	48
Waterford .... „	—	68	*Hams, York*	60	70
Cork ..... „	—	66	*Westmoreland*	60	66
Limerick ..... „	—	60	*Irish*	56	62
Sligo ..... „	—	64	*Bacon, Wiltshire, green*	62	64
Fresh, per doz.	9	11	*Waterford*	60	62

BELFAST, (Friday last.)—Butter: Shipping price, 64s. to 69s. per cwt.; firkins and crocks, 7d. per lb. Bacon, 50s. 52s.; Hams, prime, 60s. to 64s.; second quality, 50s. to 52s. per cwt.; mess Pork, 86s. per brl. Irish Lard, in bladders, 56s. to 60s.; kegs or firkins, 54s. per cwt.

July	*Butter.* per cwt.		*Bacon.* per cwt.		*Dried Hams,* per cwt.		*Mess Pork.* per brl.	
22.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1848	70 0	80 0	58 0	62 0	66 0	82 0	80 0	82 0
1849	60 0	65 0	48 0	50 0	68 0	75 0	76 0	78 0
1850	62 0	67 0	37 0	42 0	65 0	70 0	60 0	62 0
1851	70 0	74 0	45 0	47 0	62 0	66 0	64 0	66 0
1852	64 0	69 0	50 0	52 0	58 0	62 0	80 0	86 0

CHICORY.

Per ton.

Foreign root (d p.)	£ s.	£ s.	*English root (free)*	£ s.	£ s.
Harlingen	27 0	28 0	*York*	8 10	9 10
English root (free)			*Roasted & ground*		
Guernsey	10 0 10 10		*English*	30 0	40 0
Kent and Suffolk.	*none.*		*Foreign*	40 0	50 0

Duty on all Coffee and roasted Chicory imported, 3d. per lb.; on Chicory Root £21 per ton.

HIDE AND SKIN MARKETS.

			s. d.	s. d.	
Market Hides,	56 to 64 *lbs.*		0 0 *to* 0	1¾	*per lb.*
Do.	64	72 *lbs.*	0 1¾ 0	2	„
Do.	72	80 *lbs.*	0 2 0	2¼	„
Do.	80	88 *lbs.*	0 2¼ 0	2	„
Do.	88	96 *lbs.*	0 2¾ 0	3	„
Do.	96	104 *lbs.*	0 3 0	3¼	„
Shearlings			1 0 1	3	„
Lamb Skins			1 8 2	10	„
Horse Hides			5 0 0	0	„
Calf Skins, light			1 6 2	3	*each.*
Do. full			3 6 4	6	„

BARK.

Per load of 45 cwt.

English Tree	£11	0	0	*to* £13	10	0
Coppice	13	0	0	14	0	0
Mimosa ..... *per ton*	9	0	0	10	0	0
Valonia ..... „	14	0	0	16	0	0

WOOL MARKET.

LIVERPOOL, July 24.

	s d.	s. d.
Laid Highland Wool, per 24 lbs.	9 3 *to*	10 3
White Highland do.	12 6	14 0
Laid Crossed do..unwashed	10 6	12 0
Do. do..washed	11 0	12 6
Laid Cheviot do..unwashed	11 6	13 0
Do. do..washed	12 6	15 0
White Cheviot do.. do.	22 0	26 0

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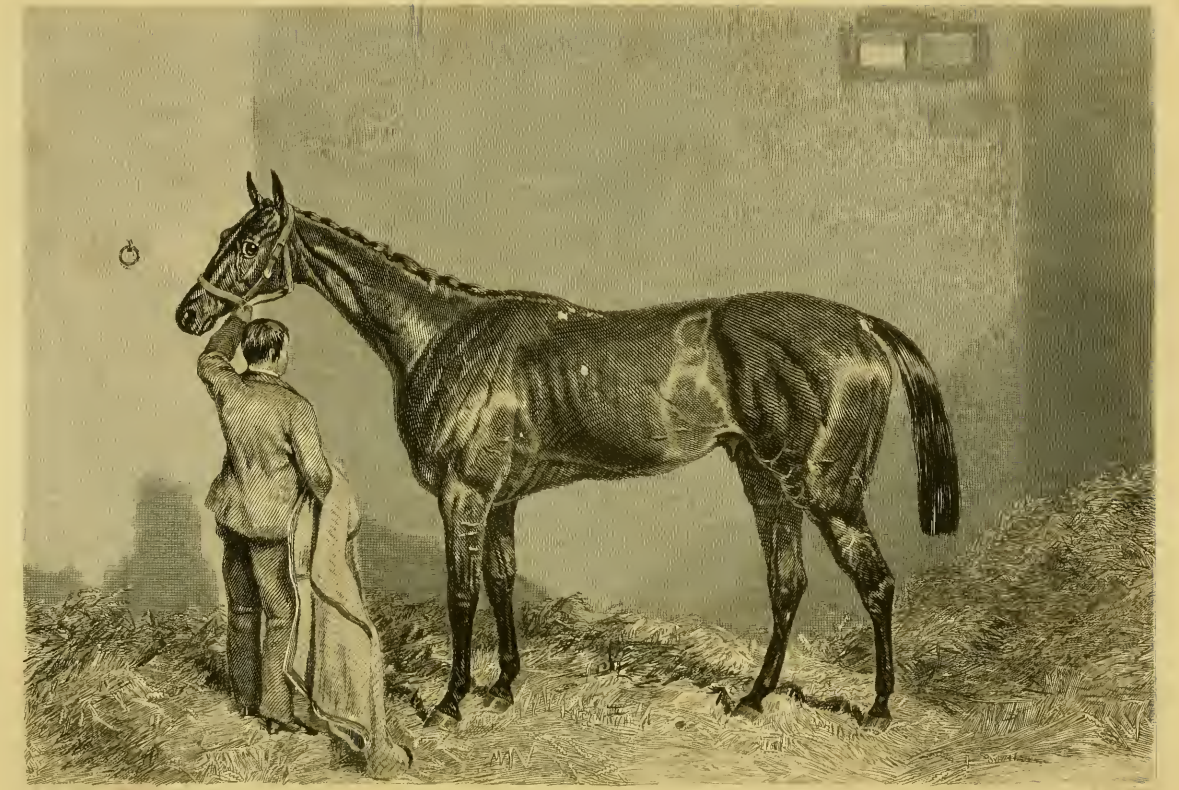


Neurmunster

The Property of Mr. Lorillard of New York

THE FARMER'S MAGAZINE.

SEPTEMBER, 1852.

PLATE I.

A SHORT-HORNED COW.

The subject of our first plate is a Short-horned Cow, the property of Mr. William Holland, of Leghcliff, near Halifax, which obtained the first prize of Twenty Sovereigns and the Silver Medal in Class 9, at the Smithfield Club Cattle Show, in December, 1851.

PLATE II.

NEWMINSTER; Winner of the St. Leger, 1851.

The subject of our second plate, Newminster, (the property of Mr. Orde, of Nunnykirk, bred in 1848 by the younger Mr. Orde, who succeeded to Nunnykirk, and with it to t'auld mare,) was got by Touchstone, out of Beeswing, by Dr. Syntax, her dam by Ardrossan, out of Lady Eliza, by Whitworth—Spadille—Sylvia, by Young Marske.

Touchstone, bred by the late Lord Westminster, in 1831, and got by Camel, out of Banter, by Master Henry, was one of the best race-horses ever saddled; while as a stallion he has long been admitted as the best we have. It would be impossible here to name a tithe of the good runners out by him; but Newminster is his third Leger winner—his son Surplice winning this race in 1848, and his daughter Blue Bonnet in 1842. Surplice, it will be remembered, also won the Derby, as did Cotherstone in 1843, and Orlando in 1844. Touchstone's only Oaks winner was Mendicant, in 1846; in fact the Touchstone fillies have always been considered the weaker half of his stock.

Beeswing's renown on the turf is quite equal to Touchstone's—indeed no runner ever enjoyed so great a popularity as "t'auld mare." In the stud, hitherto, despite the capital openings afforded them, her produce have not been in any way so successful. Her first foal, Old Port (foaled in 1844), trained on to be a most miserable-looking animal, and was quite as bad as he looked; but then first foals are nearly always indifferent. Nunnykirk (in 1846), however, was much better, and his own brother Newminster better still. Of Bonnie Bee (the produce of '47) little is known, while the three-years-old for next year, Norham, has made too much noise in the world already, having been scratched by Mr. Nicholl, at Doncaster, for all his engagements, and then given to any aspiring gentleman who chose to take him away: he is a rank roarer. Beeswing's stock now appear to go regularly, as if by contract, to Mr. Nicholl, of Newcastle-on-Tyne—a gentleman who takes to them good and bad, with all the temper and spirit our friends further north enjoy a bit of racing.

Newminster is a good bright bay horse, standing *scarcely* fifteen hands an inch and a-half high; he has a neat, nag-like, expressive head, a straight and rather long neck, with splendid shoulders, falling well back—perhaps, indeed, as fine a shoulder as ever was seen; he has good depth of girth, strong muscular back, with ribs well hooped out, and very powerful quarters; his thighs are muscular, gaskins as well as legs short, and hocks, knees, and feet good, with very fair sized bone. Newminster carries his head low, and in his clothes might be passed by as a mean-looking little horse; he, however, improves wonderfully on the eye the more you see of him—not a big one by any means, but low and lengthy, with an immense deal of power, and some really splendid racing points.

THE SCIENCE OF MANURING.

BY THOS. ROWLANDSON, C.E.,F.G.S.

CHAPTER IV.

ON SPECIAL OR PORTABLE MANURES.

The term, special manures, has been given to fertilizers of recent introduction, which are remarkable, as compared with the manures, employed formerly for their extreme portability. The title, special manure, is by no means an appropriate one, seeing that such articles as guano or superphosphate of lime are indiscriminately applied to all kinds of crops, without the slightest regard as to the special requirement of each particular species. Under these circumstances, the term, portable manures, would be much more appropriate; in difference, however, to custom, the term, special manure, will be retained with the commonly accepted signification of that term. It is to be hoped that only a few years will elapse before the title special manure, will be commonly used in its legitimate sense—that is, a manure composed of substances adequate to supply the requirements of the particular crop which it is intended to grow. Chemistry has sufficiently pointed out the rational course that should be pursued in systematic husbandry; but, although these principles have been before the public some years, no one has ever yet attempted to practically carry them out; and, for all useful purposes, husbandry is, at the present moment, as empirical an art as it was in the days of Alfred. This assertion is made advisedly, and with a full knowledge of the advantages which have resulted from the extensive use of bones, superphosphate, guano, &c., during the last few years; it is desirable, however, to draw attention to the fact, that these fertilizers have been used haphazard, and not with any regard to rule. This may be attributed partly to want of faith in the facts which chymistry has illustrated, and partly in consequence of deficient knowledge. The first is probably a consequence of the last; and, however it may be an excuse for those who are fully occupied in the ordinary routine of husbandry, it is none for such as held high scientific appointments in connexion with societies formed for the dissemination of scientific and, more particularly, chemical knowledge as connected with agriculture; for, it may be here remarked, that, in many instances, where recipes for special mixtures have been submitted to the attention of agriculturists by chemical professors, they have not unfrequently consisted of incompatible materials, or have been impracticable for general use, owing to their expensiveness. There has also ever been a halting and dubious manner of recommending chemical mixtures by those to whom, from their position, the world is apt to look up for guidance. In some measure, this may be accounted for from the fact, that most of our public guides have not hitherto been practical farmers, and have, consequently, hesitated to recommend a course, the design of which might be frustrated from some unforseen or overlooked causes. In forming recipes for manures, it is also requisite to have some acquaintance with the value and prospective prices of commercial articles, particularly potash. From a want of this knowledge it is easy to conceive how pearlash, costing 40s. per cwt., might be substituted for sulphate of potash costing only 16s. per cwt., whilst the commercial articles sold under these titles contain nearly an equal amount of potash—the pearlash having the further disadvantage of being carried away by the first shower of rain, in consequence of its great solubility. It will be seen, therefore, that in recommending a course for the agriculturist, it is requisite that chemical, commercial, and agricultural acquirements, not separately, but in combination should be brought to bear on this important subject. With no other class of men (and this is stated with regret), would so little progress have been made during a period of ten years as that which has taken place in this branch of agriculture. In any other profession or business, attempts would have been made on a tolerably extensive scale to have proved the soundness of the generally received theory regarding the action of manures, yet of the hundreds of experiments detailed in the Transactions of the Highland Society and the Journal of the Royal Agricultural Society of England, the whole appear to have been random mixtures, the ingredients mingled haphazard. They are, however, serviceable; for, when by any chance the mixtures have approximated to such as theory would point out, the most beneficial results have followed.

Bones, bones and acid (commonly known as superphosphate of lime), guano, sulphate, and muriate of ammonia, are the principal special manures that are used. There are, however, several others, as rape cake, &c.

Unboiled bones consist as follows:—

	Per cent.
Organic matter (gelatine, &c.) ..	35
Phosphate of lime	55
Phosphate of magnesia	2
Carbonate of lime	6
Soda, salts, &c.....	2
Total.....	100

When converted into superphosphate of lime, (the improved mode of using them) by adding sulphuric acid, specific gravity 1·80, equal to one-half the weight of the bones which are to be decomposed, and diluted with twice its weight of water, about 20 per cent. of the phosphate of lime in the bones will be converted into superphosphate. When the preceding proportions are used, the composition of of the so-called superphosphate of lime will be as follows:—

	Per cent.
Phosphate of lime in the state of phosphate and superphosphate	35
Sulphate of lime (gypsum)..	20
Animal matter	20
Water, carbonized animal matter, ...	20
Magnesia, soda, ...	5
	100

The quantity of animal matter in 100 lbs. of dry bone will yield about 6 lbs. of ammonia, or about four per cent. in the superphosphate of lime. In applying 100 lbs. of superphosphate of lime, we supply 20 lbs. phosphoric acid, 15 lbs. sulphuric acid, 20 lbs. lime, and 4 lbs. of ammonia, with minute portions of magnesia, &c.

Sulphate of ammonia of commerce contains—

Ammonia	21	per cent., or	470·4 lbs.
Sulphuric acid .	48	„	1075·2 „
Water	31	„	694·4 „
	100	A ton, or	2240·0 „

Sulphate and muriate of ammonia are principally obtained from the ammonia liquor of gas works: the price of the former, according to quality and quantity, being from 13s. to 15s. per cwt. The muriate of ammonia from 18s. to 20s. per cwt.

Guano, or the indurated excrements of sea-fowl, accumulated during ages on solitary islands in the Pacific on the western coast of South America, has within the last few years been imported in immense quantities for agricultural purposes; and, very justly, notwithstanding some instances of injudicious use, has become a favourite fertilizer with the farmer —in fact, from its pulverulent nature, dryness, and tolerable freedom from offensiveness, it has greatly the advantage over other descriptions of special manures.

For an excellent series of analyses of this substance, together with an accompanying treatise on the chemical properties and agricultural value of the various matters composing guano, agriculturists are much indebted to Professor Way. Such as are desirous of obtaining complete details as to the composition and value of guano, must be referred to that gentleman's elaborate paper on the subject in the tenth volume of the Journal of the Royal Agricultural Society of England. So fully do I concur with the sentiments therein expressed, and agreeing, as they do, with the general opinions I have previously published, I shall extract some of the more prominent views in his own words, instead of confining myself to merely culling the Analytical Tables.

In treating of the composition of guano, Professor Way justly observes: "The only important constituents are reduced to

1. Ammonia, or its elements.
2. Phosphate of lime.
3. Potash.

The following tables are extracted from the paper alluded to:—

TABLE I. COMPOSITION OF EIGHT SPECIMENS OF PERUVIAN GUANO.

	A	B	C	D	E	F	G	H
Water.....	18·33	17·95	12·57	12·58	12·29	13·09	14·54	13·67
Organic matter and salts of ammonia.. .	47·04	47·46	33·67	46·61	48·76	49·32	50·81	52·97
Sand and silica.....	1·31	1·34	1·72	2·79	1·15	1·42	1·12	1·42
Phosphoric acid.....	12·41	13·16	20·21	14·37	13·61	14·48	14·08	14·56
Sulphuric acid.....	3·82	3·47	4·00	4·54	4·57	4·00	3·60	2·52
Lime	9·70	10·73	16·49	11·47	11·32	10·84	9·68	10·38
Magnesia	·70	·52	·80	·62	·78	·74	0·54	0·31
Oxide of iron.....	·27	·15	·22	·23	·23	·23	0·20	0·73
Potash	3·07	2·52	3·60	3·22	4·95	2·91	3·40	1·42
Soda	2·18	·30	4·15	·91	·11	0·78	0·74	none.
Chloride of potassium.....	none.	none.	none.	none.	none.	none.	none.	2·02
Chloride of sodium.....	1·21	2·40	2·57	2·66	2·23	2·19	1·29	none.
	100·00	100.00	100·00	100·00	100·00	100·00	100·00	100·00

With regard to this table, it is well observed by Professor Way, "That it is an interesting and important fact, that guano should contain so much potash as is shown by this table to be the case; that the proportion of this alkali is frequently as much as or more than 3 per cent. of its weight, is proved by the examination of other specimens." The following being the per centage of potash and soda in eight other samples of Peruvian guano:—

Potash in 100 parts	3·27	3·19	3.43	4·60	3·43	3·74	6·49	3·73
Soda „	1·87	·63	·75	none.	1·03	·51	·67	·79

The lowest per centage of water in a number of specimens was.....	8·88
The highest	22·68
The average	13·09

It is a very common plan with dealers to dwell on the organic matter in guano and other manures in order to mislead parties into the belief that when guano is rich in organic matter it must be equally so in ammonia. For instance, one specimen analyzed by Professor Way contains 57·13 of organic matter, whilst another contained only 37·78, or nearly 50 per cent. less, yet the amount of ammonia yielded from each specimen was nearly equal, that from the former being 18·94 per. cent., and that from the latter 18·50 per cent. On this point it is well observed by Professor Way, that no analysis of guano is of any value that merely gives the amount of organic matter. In order to form a correct estimate, the quantity of ammonia contained in the guano must be expressly stated. One of the most common and extensive modes of making up fraudulent and adulterating genuine guano is to grind up half-rotten spent tanners' bark, the whole of which would class as organic matter.

The average amount of sand in Peruvian guano is 1½ per cent. It is well observed that, "Of all the ingredients of Peruvian guano the ammonia is one of the greatest value, and a knowledge of its proportion in the different specimens is of the highest importance."

In thirty-two specimens from which an average was drawn

	Per cent.
The lowest proportion was..	15·98
„ highest „ was..	18·94
„ average of 32 specimens	17·41

With regard to Ichaboe, Saldanha Bay, &c., guanos, the supply has already been exhausted, and of the immense quantity imported none remains, the large quantity vended under these titles being either adulterated Peruvian or a substance made up in imitation of guano: tanners' bark, magnesian limestone, ochre, gypsum, salt, &c., forming the bulk of, with a small quantity of ground bones and sulphate of ammonia added to the mixture.

Taking the average composition of Peruvian guano, so far as regards the three following substances, viz.:—

	Per cent.
Ammonia at.....	17·41
Phosphate of lime	24·12
Potash	3·50

Professor Way has proceeded to calculate the value of a ton of Peruvian guano, which he has done on most unexceptionable data, that is by taking the lowest price at which any of the above substances can be procured in their cheapest form, viz.:

Ammonia, from sulphate or muriate of ammonia.
Phosphate of lime, from bones or coprolites.
Potash, from muriate or sulphate of potash.

By which it would appear that

	£	s.	d.
The ammonia, at 17·41 per cent., amounts to 388 lbs. in the ton, which, at 6d. per lb., is worth....	9	14	0
The phosphate of lime, at 24·12 per cent., amounts to 540 lbs., which, at ¾d., is worth	1	13	0
The potash, at 3½ per cent., amounts to 78½ lbs., which at 2½d., is worth	0	14	8
Making a total amount of	£12	2	5

as the value of all the ingredients of a ton of good Peruvian guano.

The prices here affixed to the three principal substances which produce the fertilizing effects of guano, were calculated by Professor Way from the ammonia contained in sulphate of ammonia, valuing the sulphate at 12s. per cwt., and the potash from the muriate and sulphate of potash. In a note he correctly remarks, "That the market value of the different salt of potash is far from constant." The preceding calculations were made on the following prices:—

Carbonate of potash from 28s. to 42s. per cwt.			
Sulphate	„	at 12s.	„
Muriate	„	at 13s.	„
Nitrate	„	at 28s.	„
containing 95 per cent. of nitre.			

The per centage of potash in these salts when pure and dry is as follows:—

Carbonate (pearl ash of commerce)....	68·2
Sulphate (sal enixium)	54·0
Muriate	63·2
Nitrate (saltpetre)	46·7

Foreign pearl and potash are, however, now worth from 30s. to 35s. per cwt., and neither the one nor the other are ever to be obtained dry; these

sources of potash are consequently too high priced for the farmer to purchase; at the most reasonable calculation dry potash cannot be so obtained at a lower rate than 6d. per lb.; neither is there any prospect of their price becoming lower, as they are derived from the destruction of the woods of America and Canada, which are burned by the settlers in clearing the land for tillage, the ashes from which are lixiviated for the potash. This source of potash is certainly narrowing, both on account of the constantly increasing distance of the woods from the frontier by the annual destruction of the timber—the scarcity being more severely felt by the growing demands for the home consumption of America—in addition to which is to be added the fact that the uses to which potash is applied in our manufactures are daily increasing. From these causes there is every reason to believe that the farmer must forego any idea of restoring the potash to his fields by purchasing the ordinary pot and pearl ashes of America. If they could only be procured in sufficient abundance, and at the prices previously quoted, sulphate and muriate of potash would be the forms best adapted to the use of the farmer; of the two the former ought to be preferred, in consequence of its greater insolubility. The muriate of potash is about equally soluble with common salt. Commercial articles sold under these two denominations are rarely pure, the sulphate generally consisting of 80 per cent. sulphate of potash and 20 per cent. sulphate of soda; this is denominated cake sulphate. There is a still more inferior kind called granulated. The sort called sal enixium is generally a bi-sulphate, being two atoms of sulphuric acid added to one atom of potash, or 37·8 per cent. This kind, however, always sells proportionally higher than the first-mentioned description in consequence of being free from soda, as it can, by fluxing with limestone and small coal in a reverberatory furnace, be converted into pearl ash. The pan, or cake sulphate of potash, is usually sold at 14s., and the bi-sulphate at 15s. to 16s. per cwt. The muriate of potash generally contains 25 per cent. of common salt. These two substances cannot be distinguished from each other by taste or sight. The remaining source of potash is the nitrate, commonly known as saltpetre, the chemical composition of which is 54 parts of nitric acid added to 48 parts of potash. In using saltpetre we apply two elements of fertility—nitrogen and potash; and, in every case where it has been used, fertilizing results have followed. The nitrogen in saltpetre bears the proportion of 93 per cent. as compared with the nitrogen of commercial crude sulphate of ammonia; the latter, being valued at 12s. per cwt., will leave for the value of the nitrogen in the nitrate of potash the sum of 11s.; and if the 52·7 lbs. of potash is estimated at 3d.* per lb. it will be worth 13s. 2d., which will leave the value of saltpetre for agricultural purposes as follows:—

	s.	d.
Value of the nitrogen estimated as crude commercial ammonia, at the rate of 12s. per cwt.....	11	0
Value of 52·7 lbs. of potash at 3d. per lb.	13	2
Value of one cwt. of saltpetre..	24	2

It is rarely, however, that saltpetre can be bough at a lower rate than 26s. per cwt., at what is commercially termed 5 per cent. refraction, that is containing 5 per cent. of impurities and water, one of which is not unfrequently muriate of potash, and therefore, in an agricultural point of view, not to be deemed an impurity other than as containing chlorine (or muriatic acid) in combination instead of the more valuable compound nitric acid. In a general way farmers can scarcely expect to obtain saltpetre equivalent to the pure dry article at a less rate than 30s. per cwt., unless the Peace Society can prevail on nations to give up playing at the game of war, and miners be induced to use a gunpowder composed of a less fixed material and of greater power, when these events occur. "Villanous saltpetre may be dug from the bowels of the harmless earth" and applied to purposes less destructive than the ordinary ones which so excited the ire of Hotspur's fop. At present saltpetre appears to be the most extensive source for the farmers to resort to for a supply of potash. It may be asked, since a constant waste is occurring in potash carried away by rain, &c., whence do plants obtain their supply; it may, therefore, be here mentioned that all soils contain potash—sands the least, clays usually the most; but the potash so existing in soils is found in intimate combination with silica and alumina, and is only slowly set free by means of the atmosphere, carbonic acid, and water; following by continued disintegrating, and exposing fresh surfaces to their action, has the effect of restoring fertility to fields rendered barren by overcropping; for it is not merely necessary that potash should exist in a soil, but in order to produce fertility it must be in such a state as to be slowly converted into a soluble form, so that the roots of plants may be able to absorb it; some

* In the calculations extracted from Professor Way's paper the quotations were strictly copied from the original; there is, however, every reason to doubt that potash in any form can be obtained for a lengthened period, especially with the prospect of an increased demand, at so low a rate as 2¼d. per lb. The writer considers that 3d. per lb. for potash is as low a figure as it ought to be valued at.

granites contain from 6 to 9 per cent., and some felspars 16 to 18 per cent. of potash; but no more immediate fertility would ensue from applying any amount of these substances, ground ever so fine, than if we applied an equal weight of pounded brickbats or sandstone. In the course of a long period the granite and felspar might possibly prove of advantage by their gradual decomposition, but not in time sufficient to answer the purposes of the farmer. Attempts have been made to render these substances soluble for agricultural purposes, but as yet it is a matter of doubt whether doing so is more profitable than purchasing potash from the ordinary sources. If it could be demonstrated that silicates of potash when applied to the soil are productive of an increased crop of grain, these sources of potash would be much resorted to; but all the experiments we have seen with silicates serve to show that an application of soluble silicates tends only to increase the amount of straw, whilst it decreases the weight of the grain. There is only one instance we believe in which an application of silicates would be decidedly advantageous, viz., on old meadows; we believe that in such cases the use of silicates would forward and increase the weight of the hay crop.

Superphosphate of Lime. — This manure is formed by using two parts by weight of crushed bones or coprolites,* and one part by weight of brown acid. To make it properly the bones and acid ought to be thrown into a leaden cistern, laid on tiles or thick iron bearers so as to keep the fire from melting the lead. Farmers cannot make the article for less than manufacturers *profess* to sell the genuine superphosphate, viz., 7s. per cwt; but with this substance, as with guano, an immense amount of adulteration is practised by fraudulent dealers and manufacturers.

Nitrate of soda was extensively applied a few years ago, but greatly decreased since the introduction of guano into general use. As a source of nitrogen it is equal in value to commercial sulphate of ammonia; in fact, when the price is equal, the preference ought to be given to nitrate of soda.

Sulphate of lime can be procured in abundance in gypsum.

Sulphate of soda has not unfrequently been used both as a top dressing and as a drill manure when mixed with other substances. In some instances beneficial results appear to have followed its application, and that in cases too where it could not be accounted for on account of the sulphuric acid contained in it; in such cases the only theory that can be assigned for its beneficial influence is that it has the effect of more speedily decomposing the inorganic substances in soils existing in a mineralized state, and thus rendering them susceptible of absorption by the roots of plants—the double decompositions which are known to take place when certain salts of potash and soda are mixed in a liquid state would seem to countenance this supposition.*

Chloride of sodium, or common salt, is composed of chlorine and the metal sodium, which, in the presence of water, is converted into muriate of soda as a source of chlorine and soda, on soils where these substances are absent the application of salt promotes fertility. As the quantity required for most crops is however small—except the horticultural plants carrots and asparagus—some other cause must be assigned for the extraordinary effects which are sometimes seen on fields after an application of salt. One cause may perhaps be attributed to a property similar to that alluded to in noticing sulphate of soda; another very probable reason is that it may combine with the lime in the soil, and, according to the state of dryness or humidity, form carbonate of soda and muriate of lime, and revert to their original forms of muriate of soda and carbonate of lime. A small quantity of muriate of lime, having the effect of abstracting moisture from dews, may, in dry seasons, produce a very beneficial effect.

Sulphate of magnesia or Epsom salts is useful in affording sulphuric acid and magnesia; it has been recommended to strew this salt over dung-heaps in order to fix the ammonia, but cheaper substitutes can be obtained. Sulphuric acid can also be procured at a cheaper rate by employing gypsum, magnesian limestone, or dolomite will afford magnesia.

Sulphate of lime, or gypsum, is the well-known substance from which plaster of Paris is made, the latter being merely sulphate of lime with the water of chrystallization driven off; from the finer varieties chimney ornaments are manufactured. It may be well here to mention that in chrystalizing salt for household and other purposes at the large salt works, a scale forms at the bottoms of the pans, sometimes as thick as a couple of inches in the course of three weeks, and, in consequence of its slow conducting power of heat, has to be removed; this cake, known as pan scale, is thrown away in large quantities; it is composed of 75 per cent. sulphate of lime and 25 per cent. of common salt.

* Substances which will be subsequently noticed.

* Sulphate of soda can be procured extensively from the large alkali manufactures in the neighbourhood of Newcastle-upon-Tyne and Liverpool, price £4 per ton dry. Glaubers salts, which is also sulphate of soda, contains 55·57 per cent. of water. Sulphate of soda is frequently passed on the ignorant as sulphate of potash.

Animal charcoal is merely burnt bones, and is of little more utility than well crushed bones, whilst the price is much higher: it is an article much adulterated.

Soot.—The beneficial effects of a top-dressing of soot have been known for many years, particularly when applied to young clovers and wheats; these results are wholly attributable to the sulphate of ammonia which is found in the soot, the quantity being on an average about one-tenth of that obtained from an equal weight of common sulphate of ammonia, which would make it worth about 8d. per cwt. Great quantities used to be sent to the West Indies, particularly to Barbadoes. This is an article which is also much adulterated. Recently it has been stated that potash has been found in appreciable quantities in the soot from iron furnaces, not sufficient however, we believe, to make its extraction profitable.

Saltpetre refuse consists principally of common salt; occasionally it is also accompanied by a very appreciable percentage of muriate of potash; it may also contain about ½ per cent. of saltpetre which has not been washed out. As under the existing state of knowledge of the sources whence potash may be derived, saltpetre promises to afford the largest quantity, and in the greatest permanence, it is interesting to know what quantity has been consumed during the last few years, and also the prospects of future supplies. Compared with many years, the price of saltpetre during the past two or three years has been relatively high, the importations being comparatively small; this small production was the result of previous low prices; a large supply is expected for the present year*, so that if a demand arises for agricultural use, the prices may still be expected to rule moderately. The imports during the last twelve months amounted to 14,070 tons, which would increase in future years 50 per cent. if present prices are maintained.

Soda-ash.—This article has been much recommended of late as a remedy for the wireworm; its utility for this object is, however, very dubious. Soda-ash is manufactured on the large scale for the use of soap-boilers, making soda crystals for washing, &c. The commercial article used formerly to consist of a mixture of carbonate and caustic soda, but the manufacturers now usually carbonate the whole; whether in the carbonated or caustic state it is sold according to the percentage of caustic soda in the ash, the standard being 48 per cent., the price per ton being regulated according to the percentage, the market value on an average being 2½d. per cwt., which at the standard will be equivalent to £10 per ton. According to some experiments, it would appear that soda ash had some slight fertilizing influence, but it is quite as probable that this was owing to the presence of the sulphate of soda or common salt, which always accompanies soda ash, as to the soda ash itself.

In concluding these remarks on special manures, it will be well to remind the reader that above all things it is requisite that whenever he buys an article it is of the utmost consequence that he should know its composition; for, even with genuine guano, a reference to the tables of Professor Way will show that cargoes differ materially with regard to the quantities of phosphates and ammonia which they may contain. This is a point of great practical importance, because if the guano is to be applied to potatoes, grass, or clover, the guano containing the most ammonia ought to be preferred; if for turnips, that containing the most phosphate should be selected. If this care is requisite for the economical use of guano where the genuine article has only to be selected from, how much more requisite is it for the farmer to be careful when he is about to purchase guano of doubtful quality! To make this more evident, Professor Way gives a calculation of the value of several inferior guanos as follows—

Ammonia, 8.12 per cent., amounts to 182lbs., at 1d. per lb., is worth ..	£4	11	0
The phosphate of lime, 21.09 per cent., amounts to 472lbs., which, at ¾d. per lb., is worth	1	9	6
Potash, at say 3½ per cent., amounts to 78½lbs., which at 2½d. is worth....	0	14	8
Value of the guano.....	6	5	2

Silicates of potash and soda.—If future experience should prove the efficacy of these substances they can easily be manufactured; their use consists in supplying the silica, sand or flint which forms the exterior yellow covering of straw. On bog land this may be found serviceable; on the fens of Lincolnshire, where silica exists only in a very minute proportion in the soil, it is accounted good farming to leave the stubble very long, and afterwards set fire to it, the beneficial effects of which can only be attributed to the silica set free, as the small quantity of other inorganic matter liberated is too small in quantity to be of any great value in reclaiming bog land; it has also been observed on peaty soils that the cereal grasses will frequently grow very luxuriantly until the time when the straw ought to set, after which period the stems begin to droop and fail. A use for silicate of soda and potash on old meadow land has already been pointed out, and is well worth trying by any enterprising farmer.

Having explained the composition of farm-yard

* 1850.

manure, and the majority of those substances which are usually used as portable or special manures, as well as the composition of the crops most commonly cultivated, we shall proceed to examine the manner in which they ought to be applied so as to produce the greatest results with the utmost economy of material and the least waste.

Chapter V.

PRINCIPLES THAT SHOULD REGULATE THE APPLICATION OF MANURES.

In the earliest stages of husbandry the same rule obtained which is still found in the more backward districts at the present period, viz., taking a succession of white crops until the land will not yield sufficient to pay for the labour expended on it. At the present day instances are far from solitary in the Highlands of Scotland, Ireland, and Wales, where five, six, and seven white crops are taken successively, after which scourging, the land is allowed to recruit by what is termed "letting it out to grass" for 10 or 15 years, after which the scourging is repeated. During the cropping period manure may or may not be used, according to circumstances. As agriculture advanced, what are termed green crops became introduced, and in the course of time it was found more profitable to alternate green and white crops: whether this system is founded on correct or incorrect principles will be examined hereafter. For exemplification of the rules which ought to guide a rational system of manuring, we shall select two ordinary four-course rotations, from which it will be seen that for the article of potash alone it requires 19 tons of farm-yard manure to supply a crop of 12 tons of potatoes, and 18 tons of farm-yard manure to supply with potash a crop of 20 tons of swedes.

In order to afford the same quantity of potash to the turnip and potato crop by means of guano, we should have to supply 4,285 lbs. of guano, or nearly 2 tons, for the potato crop; and 4,000lbs. for the turnip crop.

Three-hundredweight of guano, the ordinary dressing for turnips, will only supply sufficient potash for 1½ tons of swedes. It is, in consequence of this difference in the composition of farm-yard manure and guano, that the former is found invariably to succeed, whilst the other sometimes fails, and if used continuously a time will arrive, either sooner or later, according to the character of the soil, when this excellent accessory to fertility, properly applied, will cease to create luxuriant vegetation; on bogs and sands this will be the soonest apparent. But in applying 19 tons of farm-yard manure, containing 150lbs. of potash, to the potato crop, we apply also 150lbs. of phosphoric acid, whereas the potato crop only requires 33lbs., thus supplying 117lbs. phosphoric acid more than is required by that crop, whilst the whole succeeding rotation will only consume 93lbs., or 57lbs. less than the phosphoric acid supplied by the 19 tons of farm-yard manure, perhaps this extra quantity is no more than is necessary to replace the phosphoric acid which is carried off in solution by rain water in the course of a four years' rotation. If the second rotation, commencing with turnips, is manured with 18 tons of farm-yard manure, this quantity would furnish exactly sufficient potash for a crop of swedes of 20 tons, and at the same time 139lbs. of phosphoric acid, of which the turnip crop will require 45lbs., the whole course requiring 111lbs., or 28lbs. less than the whole amount of phosphoric acid supplied by the 18 tons of manure, a surplus barely enough to compensate for the natural waste which is unavoidable.

The above facts philosophically account for the soundness of the system which is generally followed in the best agricultural districts, viz., that of applying the manure to the first, or, as it is commonly called, the green crop, rather than dividing the manure into portions, and appropriating it separately to each crop. If the manure was used as just described, and divided into four equal parts, there could only be 37½lbs. of potash applied to the potato crop, which requires 150lbs., the consequence that would follow such a division would speedily be seen in a miserable potato crop, that would not repay the mere labour of tillage and gathering, but on the other hand it may be said if the whole of the manure is applied to the potato crop, which will absorb all the potash contained in the 19 tons of manure, how are the three succeeding crops to obtain the requisite supply of potash, amounting to 92½lbs.? In answering this question, two important matters have to be taken into consideration with regard to the form in which the different mineral constituents of crops exists in farm-yard manure, and also the relative solubility of the different ingredients when set free from the organic matter, principally carbonaceous, combined with them. It must be apparent to the commonest observer, on inspecting a manure heap, that a very considerable portion of it is formed of vegetable substances only, in the primary stage of decay; until this decay has gone some length, much of the inorganic constituents of the manure are locked up in as insoluble a form as though they formed a portion of a granitic rock. When the manure is placed in the soil, the woody fibre of the straw, undecomposed portions of grain, &c., undergo a slow decay, to which Liebig has given the name of *Eremacusis* (slow combustion), at the same time evolving carbonic acid gas; whilst this action is going forward the

mineral constituents are being gradually liberated. The inorganic constituents required by plants are of various degrees of solubility; but the most important, both as regards the weight required for each crop, and also for its money value, is potash: this substance in all its forms, except when combined with silica, alumina, or as a double lime salt, is of easy solubility, and therefore very susceptible of being carried away by means of rain. It will thus be seen that two benefits accrue from applying a great bulk of manure to the green crop. In the first place the green crop requires the largest amount of potash, and absorbs it as fast as it is set free, thus preventing the great loss which would otherwise arise from the solubility of the potash liberated; whilst the green crop requires the largest amount of potash, the succeeding crops of the rotation require a much greater proportional quantity of phosphoric acid, than they do of potash. It will be seen that 19 tons of farm-yard manure will contain 150lbs. of phosphoric acid, 33lbs. of which would only be consumed by the potato crop, leaving a residue more than sufficient to supply the succeeding crops as well as for natural waste*. The phosphoric acid in manure usually exists in the form of phosphate of lime, and if not in this state, in some other form of equally difficult solubility, from which it will evidently be seen that, if the rotation had been reversed—that is, the manure applied to a white crop in the first instance—a much larger amount of potash would be supplied to the grain crop than it needed, which, from its solubility, might be carried off in solution by rain-water, the crop deriving no benefit from the excess, whilst the farmer must inevitably sustain a loss by following the inverse order of cropping to that usually practised. The reasons here adduced must convince every one that the proper mode of using farmyard manure is to apply it to the green crop, seeing that it is the least calculated to incur less by so doing, whilst at the same time it leaves a sufficient amount of phosphate for the succeeding crops of the rotation. It has already been stated that, when manure is applied to the soil, a considerable part of the inorganic matters is held in intimate combination by the carbonaceous organic matters of the undecomposed straw, grain, &c., and is only separated as the decomposition proceeds. It therefore usually occurs that some of the manure applied to the first crop is not wholly decomposed until the second or third crop, and this remark particularly applies to what is termed fresh manure. Now it is evident that, if a crop of 12 tons of potatoes is obtained by applying 19 tons of farmyard manure, it would require the whole of the potash in the manure; but if the whole of the manure does not thoroughly decompose whilst the potato crop is growing, and the probability is that it will not *thoroughly* decompose during that period, one of two things must occur—either a less weight of potatoes will be produced, or the potash required must be supplied by the soil. In order to ascertain how far the soil is capable of supplying plants with their mineral constituents, Dr. Daubeny instituted a series of valuable experiments with the soil of the Botanic Garden at Oxford. In the course of these experiments he digested some soil for four or five successive hours in muriatic acid, under the impression that whatever cannot be extracted from a soil by such a digestion must be in a state of combination as will render it totally incapable of imparting anything to a plant, for such a period of time, at least, as can enter economically into the calculations of the agriculturist; and, moreover, that all which muriatic acid extracts, but which water impregnated with carbonic acid fails in dissolving, ought to be regarded as contributing nothing towards present fertility, although it may ultimately become available as food for plants. Dr. Daubeny, therefore, first ascertained the nature and amount of the ingredients separable from a given weight of soil by means of muriatic acid; and secondly, those obtained from an equal weight by a definite quantity of water, impregnated with carbonic acid gas. Thus, by a careful analysis, he ascertained "that the soil of the Botanic Garden at Oxford contained, within an area of 100 square feet, and a depth of three feet from the surface, 3.5lbs. of phosphoric acid, 6.9lbs. of potash, and 2.9lbs. of soda, all in a state to be separated from the general mass by muriatic acid." That the above, however, were for the most part in a dormant condition, appeared from the much smaller amount of the same which could be extracted by water containing carbonic acid; for it was found that, of all the alkaline sulphates*, not

* There is not much probability of potash existing in manure, especially that made from straw, in any other form than that of a silicate, in which case it would be gradually set free during the decay of the straw, &c., by the decomposing action of carbonic acid and moisture.

* The alkalies were estimated as sulphates, as it was found more convenient to unite them with sulphuric acid, in which state they admitted of being heated and weighed without incurring loss. The following formula will represent the relative proportions of sulphates:

Lbs.		Lbs.		Lbs.	
6.9 potash	=	12.6875 sulph. potash		6.9	potash
				5.7875	sulph. acid
2.9 soda	=	6.525	sulph. soda	2.9	soda
				3.625	sulph. acid
Tot. 10.8 potash & soda		19.2125 sulph. pot. & sulph. soda		19.2125	sulph.pot.& sulph. soda

11lbs. could be procured by these means, instead of 19.2lbs.

By operating in a similar manner upon soils of the same quality as the above, which had been exhausted by several years' previous cropping, it appeared that the amount of the ingredients alluded to as *dormant* in the soil did not much vary from the above-quoted instance, but that the amount of the *active ones* was beyond all comparison *greater* in the sample of *unexhausted* soil. Dr. Daubeny, therefore, concludes that "the dormant and active portions may both be comprehended under the designation of its available constituents, whilst those which, from their state of combination in the mass, can never be expected to contribute to the growth of plants, may be denominated the passive ones.

The experiments of William Fresnius have, however, shown that the slow but continued action of carbonic acid and moisture will separate the alkalies from minerals that have resisted the influence of boiling nitro-muriatic acid. The solvent powers of carbonic acid have been tested subsequently by Professors W. B. and R. E. Rogers, of the University of Virginia (inserted in *Sillimans Journal*); also by Dr. John Davy, at Barbadoes.

From these experiments we may fairly infer that some portion of the inorganic constituents of plants may be obtained from the soil, although the manure applied may contain as much as the first crop requires. The surplus will, in such a case, remain over in great part for the use of the succeeding crop or crops.

That plants have a powerful action on the mineral substances of the soil, which enables them to render soluble minerals of a refractory nature, and thus obtain their supply of alkalies, is evidenced by what takes place when superphosphate of lime or bones is applied to the soil. Neither of these substances contain any alkali; yet their simple application, in many instances, is followed by a luxuriant crop. It is true, it may be said that the soil had previously been exhausted of its phosphate of lime, but not of its potash, and that fertility is restored by an application of phosphate of lime. This argument would hold good, were it not found, at the same time, that an application of muriate or sulphate of potash produces a like result, if a quantity of either is sown on separate parts of the same field. Fertility is also restored by means of ammonia, which does not contain any of the inorganic constituents of a plant. The last-named case demonstrates clearly that barrenness is not produced by the utter exhaustion of any one or more of the mineral constituents, otherwise fertility would not be restored by the use of an ammoniacal salt; it would, therefore, appear that when either ammonia, potash, or phosphate of lime is present in the soil, in forms easily absorbed by plants, they have separately the property of inducing greater vital energy in the plants growing thereon, by which means they are enabled to obtain the other ingredients. As an instance of something of this kind, I may quote an experiment made in Cornwall, and related in Mr. Karkeek's excellent account of the agriculture of that county:

"A piece of several acres was enclosed in 1835, and put into turnips. One portion was manured with bones, at the rate of 24 bushels per acre; the other portion of the field was simply manured with the ashes obtained from breaking up and burning the land. In the years 1836 and 1837 it was successively cropped with oats, and then laid down to permanent pasture. At the present time—nearly ten years since it was first broken from the waste, which was nothing but heath and furze—the effects of the bones can be plainly distinguished as far as the eye can reach, as if a line of demarcation had been drawn between a rich grass sward and a poor scanty pasture.

"This, and a dozen other experiments of the same kind, having attracted the attention of a great many persons interested in agriculture, and the Probus Farmers' Club, with a view of ascertaining whether the presence of bone could be detected by analysis, as it could assuredly be by the appearance of the pasture, sent samples of the soils (one from each part of the field) to Mr. Hunt, for this purpose; and, with a view of testing that gentleman's analytical abilities, he was kept entirely ignorant of the object of the Club. The following is the result:

	Unboned Soil.	Boned Soil.
Water evaporated by stove-drying	14.06	14.18
Vegetable and animal matter burned.....	12.01	12.05
Silicia and siliceous grit	49.54	49.50
Oxide of iron	7.30	7.00
Carbonate of lime	1.05	1.06
Carbonate of magnesia	0.25	0.35
Sulphate of lime.....	1.05	1.04
Muriates	0.54	0.54
Alumina	7.10	6.04
Phosphate of lime	0.10	0.75
Phosphate of magnesia	0.00	0.05
Potash.....	1.00	1.27
Humus, soluble in alkalies	6.00	6.17

"As only three crops were taken from the ground—viz., a crop of turnips and two crops of oats—it may be safely calculated that these crops did not carry away more than 80lbs. of phosphoric acid, which would only form a very small portion of the phosphoric acid contained in 24 bushels of bones, which would not amount to less than 400lbs."

The above is a good example of the property which a single special manure has of enabling plants to assimilate a larger portion than they otherwise would be capable of doing of the dormant or passive ingredients of the soil necessary to their perfect development. The increase of

potash from 1 per cent. on the unboned to 1.27 per cent. on the boned can only be accounted for by the circumstance that the phosphoric acid and nitrogen of the bones so far stimulated the growth of the turnips, oats, grass, &c., that they were enabled to assimilate a corresponding quantity of potash. Also, the deeper protrusion of the roots, owing to the more luxuriant growth induced by the aid of the bones enabled them to draw a portion of their inorganic nutriment from the lower or subsoil. The increased weight of vegetable matter thus formed again yields up its inorganic constituents, either by natural decay or as excrements voided, after being ingested by the animals grazing on the field. In this way only can the increased quantity of potash on the boned soil be accounted for. There is the stronger reason for suspecting this to be the case, as at least 100lbs. of potash must have been carried off in the three first crops, and an amount, whilst grazed, equal to the whole of the phosphoric carried away; notwithstanding which serious deductions, the *amount of potash in the soil increased 27 per cent.* I am not aware that this peculiar action has been noticed by any other observer; and to it I attribute the fact that farmers have been so much misled as to rely on manures such as guano, superphosphate, bones, ammonia, &c., for fertility, when applied singly, although separately they seldom contain more than two, and often only one, of the elements of fertility, instead of *all.* The continued use of such empirical dressings must eventually lead to disappointment and loss, as the time sooner or later must arrive when the farmer will find his fields will cease to be fertile, notwithstanding the application of his long-relied-on, but single, renovator. This must be evident when we calculate the quantity of alkalies, &c., on an acre of soil. For instance, taking the soil of the Botanic Garden at Oxford, it will be found that the amount of potash in an active or available form, in an acre of soil one foot deep, would only amount to 1001.88lbs., or sufficient for seven crops of potatoes. The injurious effects hare alluded to will be the soonest apparent on sands, chalks, and peats: a longer period will elapse before they will be perceived on clays, marls, and loams. What occurs with clover as a preparatory crop for wheat, appears to countenance this theory respecting the action of single fertilizers. It has frequently been noticed that, if the second crop of clover is pastured instead of being mown, the succeeding crop of wheat is invariably inferior. This would appear, at the first blush, entirely contrary to what has been previously stated, seeing that a certain loss of mineral ingredients must occur in the crop which is carried away from the soil, whilst depastured clover receives the benefit of the droppings from the cattle and sheep grazing on it, in which manner the greater portion of the inorganic portion of the food ingested will be again returned to the soil. It has been ascertained* that the weight of the roots contained in an acre of good mown clover amounts to about 3,630lbs. (calculated dry), while the weight of roots from a portion of the same field which had been pastured gave only 1,443lbs. Here we have at once an explanation of the cause of success in one case and failure in the other: as there was three times the weight of clover-roots to decompose on the mown portion during the growth of the wheat crop, there would consequently be three times the weight of inorganic substances set free. Mr. Short adds, "I have ascertained that the weight of roots in clover pieces *mown twice* bears a proportion to those in pastures of three to one. From this it will also be seen that physiological circumstances have to be attended to, as well as the mere mode of manuring. Another fact in connexion with the physiology of vegetation is the circumstance that generally a larger amount of inorganic matter is found in the young than the mature plant, calculating the whole plant when dry.

Fromberg has shown in the chemical investigation of the potato, ("Highland Transactions,") that the inorganic portion varies, according to his experiments, as follows.

1. OF THE PROPORTION OF ASH LEFT BY THE YOUNG TUBER.

	1. Buffs from Mid Lothian.	2. South American.	3. Ash-leaved Kidneys.
Ash per cent.	0.80	1.16	0.95
Do. calculated dry..	4.32	5.42	4.45

2. THE FULL GROWN TUBER.

	1. Buffs from Mid-Lothian.	2. Red Potato from Lanark.	3. White Potato from East Lothian.
Ash per cent.	0.78	0.96	0.75
Do. calculated dry..	3.36	4.01	3.75

In the same volume, is Mr. Norton's analysis of the oat plant; in which he remarks, that the first specimens of the young plant arrived on the 4th of June, and the succession at weekly intervals was uninterrupted until the cutting of the crop, on the 3rd of September. The oats were of the potato variety, and though retarded by the unusually wet season, were uniformly strong and healthy, the sample proving one of uncommon excellence. The plants on the 4th of June were from 4 to 6 inches in height, consisting merely of one leaf, and the commencement of the stalk.

* See Mr. T. Keir Short's "Agriculture of the West Riding of Yorkshire."

OF THE LEAF.

The following table exhibits the proportions in the leaf, at successive stages of its growth: 1st of water, 2nd of ash, 3rd of ash calculated dry.

Day of the month received.	Per cent. of water	Per cent. of ash.	Per cent. of ash dry
June 4th	80.51	2.16	10.83
June 11th	82.76	1.86	10.79
June 18th	82.02	1.63	9.07
June 25th	78.53	2.35	10.95
July 2nd	80.26	2.24	11.35
July 9th	76.97	2.81	12.20
July 16th	76.53	3.06	12.61
July 23rd	77.61	3.85	16.45
July 30th	77.00	3.78	16.44
Aug. 6th	76.63	3.75	16.05
Aug. 13th	74.06	6.14	20.47
Aug. 20th	79.93	4.25	21.14
Aug. 27th ...	70-68	6.49	22.13
Sept. 3rd	24.60	15.78	20.90

During the whole growth of the plant, the diminution in the quantity of water in the leaf was not great, being only about 10 per cent from the 4th of June to the 27th of August; so late as the 20th of August, it was nearly as high as the first. When the plant becomes ripe, however, the leaf at once withers, and this accounts for the great decrease of water between the 27th of August, and the 3rd of September. This decrease of water gives a great apparent increase of ash in the undried leaf; when calculated dry in the last col. there appears an actual decrease from the two preceding weeks. There may have been some change in the circulation at the last, by which a portion of the inorganic materials were carried back into the stalk,

OF THE STALK.

The per centage of water, of ash, and of ash calculated dry, were determined as in the leaf.

Day of the month received.	Per cent. of water.	Per cent. of ash.	Per cent. calculated dry.
June 4th	87.04	1.36	10.49
June 11th	87.05	1.28	9.88
June 18th	87.13	1.28	9.32
June 25th	84.74	1.40	9.17
July 2nd	83.66	1.28	7.83
July 9th	82.05	1.40	7.80
July 16th	80.85	1.52	7.94
July 23rd	79.60	1.63	7.99
July 30th	76.64	1.74	7.45
Aug. 6th	75.66	2.01	7.63
Aug. 13th....	69.80	2.00	6.62
Aug. 20th	76 27	1.58	6.66
Aug. 27th	71.57	2.19	7.71
Sep. 3rd	71.70	2.36	8.35

The decrease of water during the growth of this part of the plant is considerably more than in the leaf. The quantity of ash in the undried straw (third col.) increases towards the end, as in the undried leaf. This, in both cases, is owing to the gradual disappearance of the water; for we see in the last column, that the actual per centage of ash in the dried stalk is less on the 3rd of September than it was on the 4th of June.

In the earlier growth of the stalk, the dried stem or solid part, though less in quantity, actually contains a larger per-centage of ash than is afterwards necessary for its perfect maturity. As the stalk is a part of the plant, through which must pass the inorganic materials necessary for building up all the other parts above ground.

COMPOSITION OF THE ASH FROM THE LEAF OF UNRIPE OATS AT DIFFERENT PERIODS OF GROWTH.

Day of month received.....	June 4.	June 14.	June 18.	June 25.	July 2.	July 9.	July 16.
Potash and Soda	24.60	23.51	26.21	28.10	18.78	16.09	18.35
Chloride of sodium	16.34	13.54	11.30	7.56	7.92	4.09	0.30
Lime	8.44	7.24	7.33	6.74	6.91	5.93	5.13
Magnesia.....	5.33	3.11	3.47	3.06	2.39	2.35	1.63
Oxide of iron	0.61	0.52	0.72	0.99	0.40	0.34	0.55
Sulphuric acid	11.74	12.85	10.59	7.88	9.56	6.45	13.05
Phosphoric acid	16.16	10.57	10.12	8.76	6.92	6.44	2.91
Silica	16.58	28.54	30.31	36.50	47.62	58.28	58.22
	99.80	99.88	100.05	99.59	100.14	99.97	100.14

The most striking feature of this table is the gradual disappearance of chloride of sodium (common salt) until it becomes less than one-third of a per-cent. It is unfortunate that Messrs. Norton and Fromberg omitted, in the analysis of the ash, in the preceding and following table, to separate the potash from the soda. The per-centage of phosphoric acid greatly diminishes in both tables, so much so that it would appear to be necessary to supply more of the inorganic constituents of a crop in the green than the ripe state; the disproportion in the case of oats, however, appears much more glaring, in consequence of the large per centage of silica, which is absorbed as the plant matures.

THE COMPOSITION OF THE ASH FROM THE STALK OF THE UNRIPE PLANT.

Day of the month received...	June 4.	June 11.	June 18.	June 25.	July 2.	July 9.	July 16.
Potash and soda	24.29	21.45	26.49	28.86	36.26	30.10	42.43
Chloride of sodium	32.66	34.65	24.94	24.57	11.62	17.82	4.46
Lime	2.40	4.22	3.74	2.42	2.64	1.60	4.12
Magnesia	0.88	3.20	2.20	2.58	1.17	2.27	1.47
Oxide of iron	0.39	0.30	0.40	0.58	0.88	0.68	0.62
Sulphuric acid	6.15	7.82	8.51	4.87	7.98	9.09	7.84
Phosphoric acid	16.15	13.96	12.51	7.81	2.21	5.57	6.31
Silica	16.29	14.32	20.41	28.08	36.64	32.39	34.85
	99.86	99.92	99.24	99.77	99.40	99.52	100.33

Of the above table it is remarked, by Mr. Norton, that the decrease in the quantity of chloride of sodium is here also very remarkable, from 32½ to 4½ per cent. The phosphoric acid continued without much variation, until the 25th of June, when the oat itself began to form; by the 2nd of July the oats had shot up from the stalk, and become visible; in that week a marked and sudden decrease took place in the phosphoric acid. In the two succeeding weeks it began again to increase. No very great changes seem to have taken place in the other constituents, excepting the gradual increase of silica.

COMPOSITION OF ASH FROM THE WHOLE OAT, AT DIFFERENT PERIODS OF ITS GROWTH.

Day when received,....	July 2.	July 9.	July 18.
Potash and soda	32.92	31.31	31.37
Chloride of sodium	10.37	8.10	0.61
Lime	2.70	5.40	6.76
Magnesia	3.44	4.52	2.94
Oxide of iron	0.39	0.21	0.35
Sulphuric acid	10.35	12.78	16.42
Phosphoric acid	14.02	20.09	15.19
Silica	24.40	17.05	26.05
	98.59	99.46	99.69

During these three weeks the oat attained nearly its full length, but was yet quite green, and the grain had scarcely begun to form in the interior of the husk. Again the diminution of chlorine appears very great, and serves to show that common salt exercises an influence in vegetation other than as a mere mechanical constituent of the ripe plant, as its presence cannot solely be attributable to simple absorption, otherwise why should it not be present in as great abundance on July 18th, as July 2nd? In both cases the crops were green. These experiments therefore justify the opinion held by some, that plants have the power of selection, and also of excretion.

From the above experiments it appears to be necessary that the soil should always possess either naturally or by artificial means, a larger amount of the inorganic constituents of plants capable of absorption, than that required by a crop when ripe.

It must be obvious that special or portable manures have one decided advantage over farm yard manure, viz., the facility with which they can be applied during any period of the growth of crops. Of this circumstance considerable practical advantage may be derived by supplying in larger proportion the particular food required at any given stage of the crop. Taking wheat as an example, it must be evident that it will require only very small quantities of inorganic food from the period of sowing in Autumn until Spring; but if the manure is applied at the time of sowing, a very great loss must occur, through a portion being washed away during the rain of winter and spring. A small quantity applied at the time of sowing, and two or three top-dressings, say from February until May, or the period when it begins to shoot out, would be the more economical mode of manuring, and would also be found more effective in its results. Wheat steeped in putrid urine, or, if greater luxuriance is required, add thereto a small quantity of an ammoniacal salt (Campbell's celebrated steeping fluid), and instead of drying it solely with quicklime, use a few pounds of bones ground as fine as flour, or precipitated phosphate of lime, would be manured quiet sufficiently until February; towards the latter end of which month, or the commencement of March, 1 cwt. of a manure composed of the mineral constituents of wheat mixed with ashes * or burned clay, and a little azotised manure, might be applied, another in April, and another in May, the cost of which ought not to amount to more than 21s. to 25s. It is not so easy to dress green crops with manure after they are once planted or sown, as it is to dress corn, clover, or grass crops. This is not a matter of so much consequence; as by using the manures with a drill the whole is dropped in the immediate vicinity of the plant; and the heavy rains of midsummer occur at the period of the greatest growth of green crops, assist their

* The ashes and burned clay are only added to assist in spreading, therefore it is not necessary to confine the proportion to 1 or 5 cwt. If soot was mixed with the compost, it will be still better.

action. The state of division, as well as chemical combination, in which the inorganic constituents of plants exists in a manure, are matters of some importance. They ought not to be either too soluble or insoluble. Liebig proposed combining the alkalies with calcareous substances to render them less soluble: this if *honestly* done by a manufacturer would be of great advantage.

The superior action of some of the recently introduced manures appears to be principally owing to their minute division, and in some cases also in consequence of converting a substance of difficult solubility into a soluble one. Superphosphate of lime presents in itself an illustration of these two forms; bones, &c., containing phosphate of lime being converted by the agency of sulphuric acid in the first place into the soluble superphosphate of Lime; but as it meets with the alkalies and lime in the soil, it becomes changed into the neutral phosphate of lime, a white powder as fine as flour.

Sufficient has already been stated to show why farm yard-manure should invariably produce good results, whilst one or more of the special manures commonly and as frequently disappoints the expectations of the farmer; the reason may, however, be repeated—viz.,that the farm-manure contains *all* the ingredients necessary for a crop, whilst the special manures only contain *a part*; consequently, if the soil does not contain those constituents of which the manure is deficient, an indifferent crop must be the result. Nothing can be more absurd than to mix guano, superphosphate of lime &c., with farm-yard manure; seeing that the latter is not deficient in phosphoric acid, but rather of potash, it would be much more rational to use a less quantity of farm-yard manure, and make up the deficiency with liquid manure; seeing that the liquid manure is richer in potash than farm-yard manure, but deficient in phosphates. For instance, fifteen tons of farm-yard manure would contain—

	Potash.	Phos. Acid.
	lbs.	lbs.
	57.8	57.8
Five tons of liquid manure, at .664 per cent. potash and .07 per cent. phosphoric acid, would contain	74.168	7.84
	131.968	65.64

Or where special manures are used, not containing any potash, seven to ten tons of liquid manure distributed over the field after the manure and seed were drilled in, would supply not only the deficiency of potash in the special manure, but would also afford a copious supply of moisture at a period when it is much needed, whilst at the same time the plant would be pushed forward so vigorously in consequence of the exceedingly soluble form in which the liquid manure would present the mineral ingredients adapted to its growth during the early stages, that there would be every probability of its shooting forth with sufficient luxuriance to be placed out of danger from the fly, during a dry turnip seeding season. These matters are often of vital importance to the farmer. From what has been stated, it must be evident to every reflecting farmer that farm-yard manure ought only to be used with the green crop, as to that only can it be most beneficially applied. Manuring grass lands with farm-yard manure is in a great measure manuring the atmosphere.

The importance of using a larger amount of potash in portable manures than is ordinarily employed is evidenced by the fact that all the experiments made on the feeding powers of turnips, or their true value, indicate that although equal weights of produce may be obtained, those produced by manuring with guano are greatly deficient in feeding properties. Lord Blantyre had three lots of cattle put up and fed with turnips; lot 1 fed on those grown with dung alone, lot 2 with guano alone, lot 3 half-dung half-guano; the increase in lot 1 was 2,538 lbs., in lot 2 2,318 lbs., lot 3 2435 lbs.; the weight of turnips eaten in each case was about the same, and was the produce of nearly equal spaces of land. — See Highland Transactions March, 1852.

WHEAT SOWING.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

At a period when wheat sowing commences so extensively in almost every district of our country, a few scattered notices, tending to the more profitable cultivation of the crop, may not be without their utility if brought together for the farmers' use.

It may serve to encourage us in our efforts to procure the seeds, and adopt the cultivation the best adapted to our land; if we reflect upon the vast improvements which have taken place both in the extended growth and in the improved cultivation of wheat during the last century and a quarter —since the days when Jethro Tull farmed on the chalk formation near Hungerford, in Berkshire, and endeavoured to induce his brother farmers to adopt his machines and imitate his mode of tillage. Tull was evidently before his age in many points; he carried, it is true, his theories too far, and had evidently neither the temper nor the caution requi-

site to ensure success. He was the earliest advocate of thin sowing, and of a repetition of crops on the same soil, and it is noticeable in reading his "Horse Hoe Husbandry," published in 1733, how much he saw possible in agricultural machinery that far abler machine-makers than Tull could employ have since accomplished.

At page 122 of his first edition, Tull gives an estimate of the expenses of an acre of wheat, which is interesting, as showing the farmers' expenses, in the parish of Shalford, 120 years since. He remarks—"The usual expenses of an acre of wheat, sown in the *Old Husbandry*, in the county where I live, is in some places for two bushels and a half of seed, in other places four bushels and a half; the least of these quantities, at three shillings, being the present price, is seven shillings and sixpence; for three ploughings, harrowing, and sowing, sixteen shillings, but if ploughed four times, which is better, one pound. For thirty loads of dung to a statute acre is two pounds five shillings. For carriage of the dung, according to the distance, from two shillings to sixpence the load, one shilling being the price most common, is one pound ten shillings. So that—

	£	s.	d.
In seed and tillage nothing can be abated of	£1	3	6
For the weeding	0	2	0
For the rent of the year's fallow	0	10	0
For the dung—'t is in some places a little cheaper, neither do they always lay on quite so much; therefore, abating 15s. in that article, we may well set dung and carriage at	2	10	0
Reaping, commonly 5s., sometimes less.	0	4	6
	£4	10	0

In comparison with this old husbandry, Tull gives an account of the cost of an acre of *drilled* wheat under his system; the ground being in that way unmanured, and drilled at very wide intervals:

	£	s.	d.
For seed	£0	2	3
Tillage	0	4	0
Drilling	0	0	6
Weeding	0	0	6
For uncovering	0	0	2
Brine and salt	0	0	1
For reaping	0	2	6
	£0	10	0

The farmer will notice that these expenses were much below those of our time. It will be found, however, from the following table, that the prices which then ruled were even lower than at present. The subjoined table, constructed by Mr. W. Hoskyns, gives the decennial fluctuations in the price of wheat, from 1646 to 1815, from 1816 to 1828, and from 1829 to 1841; exhibiting the highest and lowest annual average in each decennial period, and the population of England.

The reader will notice, from this table, that when Tull was farming, the population of England was not one-third that of the present day.

Year.	Price. s.	d.	Price. s.	d.	Population.
1646 to 1655	77	10	23	9	
1656 1665	67	9	37	1	
1666 1675	62	10	33	0	
1676 1685	55	0	34	9	
1686 1695	61	11	23	0	
1696 1705	65	0	26	11	5,134,516
1706 1715	71	11	23	9	5,066,337
1716 1725	44	5	31	9	5,345,351
1726 1735	49	11	24	4	5,687,993
1736 1745	46	5	22	9	5,829,705
1746 1755	40	10	29	8	6,039,684
1756 1765	55	0	27	7	6,479,730
1766 1775	59	1	41	10	7,227,586
1776 1785	54	3	34	8	7,814,827
1786 1795	75	2	40	0	8,540,738
1796 1805	119	6	51	10	9,172,980
1806 1815	126	6	65	7	10,163,676
1816 1828	96	11	44	7	11,978,875
1829 1841	70	8	39	4	15,911,757

A similar, although improved mode of cultivation to that advocated by Tull is now practising by the author of the "Word in Season," the Rev. S. Smith, an able and zealous clergyman, of Northamptonshire. He, too, drills at very wide intervals, employs little or no manure, relies upon deep stirrings of the soil, and fallows between the rows. He gives the following statement of the expenses of his wheat cultivation in 1851:

	£	s.	d.
Ploughing the half portion of the acre	0	6	0
Harrowing, levelling, and cleaning the foul stubble	0	10	0
Pressing the channels	0	1	0
Dropping the seed by hand	0	5	0
1½ pecks of seed	0	2	0
Rolling	0	0	6
Hoeing the rows, scarifying the intervals, bird keeping, and all the operations down to harvesting and marketing	2	0	0
Rates, taxes, and interest	0	10	0
Total outlay	£3	14	6

PRODUCE.

	£	s.	d.
5 qrs. 1 bush. of wheat, at 35s	8	19	4
2 tons of straw, at 40s	4	0	0
	£12	19	4

In this mode of culture its author supposes that the land is a good deep wheat soil, that will bear a gradual deepening by the spade until a depth of 20 to 24 inches is attained. This, there is no

doubt, is a very material element in the successful mode of cultivation adopted by Mr. Smith; there is, in fact, little or no question but that the clay soils of Northamptonshire would for some time continue, under this mode of cultivation, to supply the wheat plant with potash and other essential constituents. It does not follow, however, that this would be the case on all soils. It is certain that the amount of the mineral ingredients found in the wheat grown on different soils varies very considerably. This was shown by the experiments of Professor Way (*Jour. R. A. S.*, vol. vii. p. 593); the following is the result of his analysis of the ash of the straw and chaff of the Hopetoun and red-straw white wheat produced on five different soils:—

		Red-straw White.			
	Hopetoun. Sand.	Sil. loam.	Cal. brash.	Clay.	Cal. clay.
Silica.....	69·36	70·50	71·49	68·92	66·13
Phosphor. acid	5·24	5·77	3·37	3·21	8·85
Sulphuric acid	4·45	3·31	2·28	2·21	2·23
Lime.....	6·96	3·53	7·34	5·63	6·82
Magnesia	1·45	3·29	3·53	1·76	3·62
Perox. of iron.	0·73	0·14	1·11	0·43	0·54
Potash	11·79	12·76	9·47	15·50	11·76
Soda.....	—	0·68	1·39	2·29	—
Ash of chaff..	10·36	13·78	7·0	9·45	9·63
Ash of straw .	4·16	4·68	2·74	4·20	4·95

In any case, however, there is abundant evidence already produced to induce extended and careful trials of the advantages of wide intervals, and of varied proportions of seed. The produce of wheat, when sown in small plots or in single or outside rows, is commonly very large indeed—and such as ordinary field cultivation never attains. It is difficult to give any satisfactory answer to this, which does not partly assign as the reason for this great produce abundance of space for the roots and a more free exposure to the air. The trials upon thin seeding, however, do not exactly furnish an answer to the question as to wide intervals. The Tullian object of Mr. Smith is, to drill the wheat at such wide intervals that the portion of the soil between the rows of wheat are fallowing, whilst the remaining portion of the soil is producing a crop. Now, in the ordinary thin-seeding system, the drills are usually set at the same *distance* as in thick sowing.

If, however, we confine our attention only to the thick and thin seeding of wheat, then the experiments of Mr. Hay, of Whiterigg, in Roxburghshire, are well-worthy of the reader's attention. These were conducted, as Mr. Hay remarks, with the view of testing the dibbling and broadcast thin seeding of wheat; the seed used was from ¾ of a bushel up to 2¾ bushel per acre. These quantities were sown at different periods, and under almost every variety of succession. The fields were six in number, and all of them of stiff clay, with a retentive subsoil. The conclusion which Mr. Hay draws is, that if wheat be early sown, then thin sowing is more profitable than thick. The seed employed was Hunter's Hoptoun. The following tables give the results in all the trials:—

No.	Previous crop.	Sown.	Seed. Bush.
1	Fallow.....	dibbled ..	0¾
2	,,	broadcast	1
3	,,	,,	1
4	After tares	,,	1½
5	After potatoes..	dibbled ..	0¾
6	After turnips ..	broadcast	1
7	,,	,,	2
8	After lea.....	,,	2¾
9	After hay	,,	2¾
10	After cut grass	,,	2¾

No.	Sown.	Reaped.	Produce per acre. Seed. Bushels.	Straw. Stones.
1	Aug. 31	Sept. 1	31·6	384
2	Sept. 20	Aug. 26	29·6	344
3	,, 20	Sept. 1	37·6	456
4	Oct. 14	,, 10	31·2	328
5	Sept. 27	,, 22	28·8	360
6	Oct. 9	,,	36·0	384
7	Nov. 7	,, 20	32·4	384
8	Dec. 28	,, 23	26·8	296
9	Feb. 13	Oct. 6	29·6	352
10	,,	,,	34·0	360

It is from such practical modes of increasing his information that the skilful farmer will derive the best, the most certain knowledge. He can vary these according to the circumstances in which he is placed. He can conduct these trials, in many instances, with but slight trouble, and having due regard to the nature of his soil and subsoil, the elevation of the land, the climate in which it is situated, and other local circumstances. To stimulate him to such trials, let him be well assured that there is ample evidence to show that the utmost limits to the productiveness of the soil are not nearly yet attained. That much larger crops of wheat than those to which we are accustomed have been in several instances obtained, is certain; and although we are, in several such cases, quite unable to find any reason for these great crops, yet they serve to prove one most important and encouraging fact—that there is no reason why the soil is unable to produce much larger crops than any which the land now yields. Such trials as those to which, in the present seed-time, I have been directing the farmer's attention, are attended

with not only the increase of knowledge (and that, too, whatever may be the fate of the experiment), but that information is acquired without risk, and in any case tends to dispel all those complacent and injurious feelings, as to the perfection of agriculture, in which we are all far too apt to indulge.

AGRICULTURAL BIOGRAPHY.

(Continued from page 103).

VI.—Scot, 1576.

Reynolde Scot was a learned English gentleman, and the younger son of Sir John Scot, of Scots-hall, near Smeeth, in Kent. He was bred at Oxford, and gave himself up wholly to solid reading—to the perusal of obscure authors that had been neglected by the generality of scholars—and in times of leisure to husbandry and gardening, as appears by his book on a hop-garden, which was the first treatise written on that subject. He also wrote a book entitled "Scot's Discovery of Witchcraft," 401 pages quarto, 1562: the absurd and abominable pretences to which he seems to have first detected publickly, at least in our nation. Scot died in 1599.

The first publication on the subject of hops appeared in 1576, and was entituled—"A perfite platform of a hoppe garden, and necessary instructions for the making and mayntenance thereof; with notes and rules for reformation of all abuses commonly practised therein, very necessary and expedient for all men to have which in any wise have to doe with hops. Now newly corrected and augmented by Reynolde Scot." There may have been an edition previous to the date here used, as Weston writes the author's appearance in 1574, and the "Bibliotheca Britannica" mentions two editions in 1573 and in 1578. We subjoin the contents of the work, as it claims, along with Fitzherbert's book on agriculture, the same priority on a special subject.

THE TABLE.

To constitute a perfect platform, the author advises ground that is good for the purpose—a convenient standing, and a proper quantity. Good land he calls rich, mellow, and gentle, and the situation to have the sun shining upon it the greater part of the day. He advises to have a certain term of the land, least another man reap the fruit of labour and expense. He recommends the distance of seven or eight feet between the hills of plants, and two or three roots to be placed in one hole. Four poles, best of alder, are placed in each hole, set as now-a-days, and leaning a little outward one from another. Throughout the work cuts are given of most of the performances, and the book shows a thorough acquaintance with the subject, of which the practice is not very much altered in the present time. The oasts are neatly described and figured, the dried hops are to be brown and yet bright, and the fire is to be of great wood, and not too dry. The book is printed in the old English characters, with the

headings of chapters and the titles in the modern type. The getting up of the work is ahead of Fitzherbert's.

VII.—Googe, 1577.

Barnaby Googe was a celebrated poet and translator, who lived in the sixteenth century; but of whom little is known, unless that he was educated at Cambridge, and afterwards entered in Staples Inn. It is conjectured he may have been born about 1538, and is supposed to have been the Barnaby Googe who was a relation and a retainer to Sir William Cecil, Queen Elizabeth's minister, and who by his interest was gentleman pensioner to the Queen. He is thought, with great probability, to have been the father of Barnaby Googe, Master of Magdalen College, Cambridge, who was incorporated at Oxford in 1605, when King James visited the city. He is said to have been of Albingham, or Alvingham, in Lincolnshire, and grandfather to Barnaby Googe, Esq., who lived there in 1634. The epistle to the book of husbandry is dated at Kingston, February 1, 1557. His first publication was sonnets and epitaphs, and followed by the "Zodiake of Life." He translated, in 1577, "Foure bookes of husbandry, collected and printed at Cologne in 1573, by Conrad Henesbach, chancellor to the Duke of Cleves, in Germany; containing the whole art and trade of husbandrie, gardening, graffing, and planting; with the antiquitie and commendation thereof; newly Englished and increased by Barnaby Googe." On the last leaf, old English rules for purchasing land—in verse. His other works were numerous.

The work on husbandry is managed in dialogues between persons who are three or four in number, and consists of question and reply. The first book is on arable ground, tillage, and pasture; the second on gardens, orchards, and woods; the third on feeding, breeding, and curing of cattle; the fourth on poultry, fowl, fish, and bees. The work is printed in old English type, and contains 360 pages.

The old English rules for purchasing land, are:

First see that the land be clear
In title of the seller;
And that it stand in danger
Of no woman's dowrie;
See whether the tenure be bond or free,
And release of every fee-of-fee;
See that the seller be of age,
And that it lie not in mortgage;
Whether ataile be thereof found,
And whether it stand in statute bound;
Consider what service longeth thereto,
And what quit rent thereout must goe,
And if it become of a wedded woman,
Think thou then on covert baron;
And if thou may in any wise,
Make thy charter in warrantise,
To thee, thine heyres, assignes also;
Thus should a wise purchaser doe.

Googe gives the following authors as his authorities, some of whom were contemporary with Fitzherbert, but none are mentioned by him, and their works are wholly unknown.

S. Nich. Malbee	M. Hen. Brickbull
M. Cap. Bingham	M. Franklin
M. John Somer	H. King
M. Nicas. Yetawent	Richard Andrewes
M. Fitzherbert	Henry Denys
M. Will. Lambert	William Prat
M. Tusser	John Hatche
M. Thom. Wherenhall	Phillip Partridge
M. Rich. Deering	Kenworth Darfroth.

The four bookes of husbandry, as translated by Googe, underwent a second edition in 1586, and in 1614 Gervase Markham republished the work with notes and illustrations, with the view of accommodating German agriculture to the climate of Britain. The attempt had little success, and Googe's work sunk in estimation.

VIII.—Mascall, 1581.

Leonard Mascall wrote several books on agricultural subjects, and has always been reckoned a genius in that department of human industry. Nothing seems to have been known of his parentage, birth, education, or general employments: he only relates of himself that he was chief farrier to King James, and dedicated his work to Sir Edward Montague, Knight.

"The husbandrye, ordring, and governmente of poultrie," was the first work published by Mascall, and is dated in 1581. It is a small 12 mo., of 154 pages, printed in black letter, and dedicated to Mistresse Catharine Woodford, wife to Maister James Woodford, Esq., and Cheese Clarke of the Kitchen to the Queenes Majestie. The matter is headed, "The nourishment and government of poultrie;" and as the work is the first writing on that subject, the chapters are subjoined, as was done with Fitzherbert and Scot.

Chap.
1. The order of Columella for the henne-house
2. Stephanus, his opinion
3. Signes in a good cocke
4. The signes and properties of a good henne
5. When to set your hennes
6. The time best to set your yong hennes
7. Of chickens newly hatched
8. How to keepe egges long
9. Egges to gather and keepe
10. Egges, to have all winter
11. Chickens of a later broode
12. How to feed chickens from the same
13. The pippe, and the cause, to helpe also
14. To helpe the catarte or rewme in poultrie

Chap.
15. How many hennes to a cock
16. Of hennes that hatches abroad, as in bushes
17. Cause of flux in poultrie
18. Remedies against the flux
19. Against stopping of the belly in poultrie
20. Against lice and vermin in poultrie
21. Of vermin that bytes and stinges poultrie
22. Of sitting hennes that rise in weat and rainie dayes
23. What time to cut young cock chickens
24. Against inflaming the eyes and the hawe
25. Cramming and fatting of capons
26. Meate for hennes and other poultrie, and where and when to feede them
27. To fatte hennes best
28. The feeding of bigge chickens
29. To feede or cramme young pullets
30. Ordering and setting forth poultrie on mirragges
31. The order in carving poultrie of some here in Englande
32. Other things necessary to knowe for the keeping of poultrie
33. The nature and governmente of geese
34. Of places and houses for ordering of geese
35. A ground and pasture best
36. To choose ganders and geese with all white feathers
37. The laying and setting of a geese, and feeding the young goslings
38. The fatting of yong geese
39. How many geese to one gander, with other government
40. Of the feathers of geese which are best, and what time to pluck them
41. Of ducks, teales, sheldrakes, and such like
42. How to take four wilde ducks in the covert
43. The common feeding and nature of duckes
44. Of turquie hennes, profite and also disprofite
45. The nourishing of old turquies
46. The age of turquie cocks best to tread
47. Of the turquie hennes sitting, hatching, and nourishing the chickens
48. The feeding and the ordering of turquie hennes and chickens
49. The common feeding of turquies
50. Of peacockes, the nature and feeding
51. The time best to set your pehenne
52. Of the goodnesse of the pecocks flesh, and their nature in laying
53. The hatching and feeding of young pechicks
54. The sicknes of pehennes
55. The nature and feeding of swannes
56. The nourishing and fatting of swannes
57. The order and profite of pigeons, and place for them
58. To replenish your dove-house, and to choose the best breeders
59. Time to feede them, and to maynetaine your broode
60. Of the meate and drinke for pigeons, and flying abrode
61. How to perfume your dove-house, to cause them to breed and to love it
62. Pigeons seeking their meate farre, are raveners of corne

Chap.
63. To draw pigeons to your dove-house
64. The nature and profite of wood pigeons, culvers, and rough-footed doves
65. How to take owles that haunt your dove-houses
66. For polecats and weasels that haunt your dove-house
67. To take boxardes and staves that molest your dove-house
68. How to stock your dove-house
69. Of pegion dongue
70. Of turtle-doves
71. The ordering and fatting of beavres
72. The ordering and nourishing of partridges
73. Quayles feeding, and their nature
74. The gulles, how to feede
75. Of puets
76. How to fat terantes
77. Of godwits, knots, and stynts
78. Of plovers
79. Of the bitter and curlew
80. Of blackburdes and thrustles
81. To make white burdes come of anye egges
82. To make hennes of the colour of your egges ye set her
83. For geese
84. To make hennes lay
85. For breeding capons.

To cause hens to lay eggs all the winter, the author directs to take the croppes of nettles when ready to seed, dry them, and mix them with bran and hempseed, and give it to the hens in the mornings, and also to give them the seeds of cowmake, a weed so called in "Turner's Herbal."

The second work appeared in 1596, and is entituled "the government of cattell, divided into three books: the first treating of oxen, kine, and calves, and how to use bulls, and other cattell, to the yoke or sell; the second discoursing of the government of horses, with approved medicines against most diseases; the third discoursing of the order of sheep, goats, hogs, and dogs, with true remedies to help the infirmities that befall any of them. Also perfect instructions for taking of moals, and likewise for the monthly husbanding of grounds; and hath been already approved, and by long experience entertained amongst all sorts, especially by husbandmen, who have made use thereof to their great profit and contentment."

The copy of the above book in the British Museum is dated in 1662, and has the frontispiece covered with figures, or rather caricatures of horses, cattle, sheep, swine, goats, and dogs. An enlarged figure of a horse is separately delineated, and lines are drawn from each particular part of the body where disease may prevail to the edge of the paper, and there is written the name of the disease, with the number affixed which it holds in the catalogue of disorders: the number amounts to 60.

An edition of Mascall's second work was pub-

lished in 1680, enlarged by Richd. Ruscan, Gent. In it the figure of an ox is delineated, with lines denoting the diseases as for the horses: the disorders reach to 44.

In 1600 there was published with Mascall's name —"A booke of fishing with hooke and line, and of taking all manner of vermin with engines and traps: suitable for all warrenners, and for sporte and pastime."

The practical knowledge of Mascall relates chiefly to diseases, with a small notice of the animal and its breeding; but such as it is, a large advancement was made by it towards an improved practice.

IX.—Plat, 1593.

Sir Hugh Plat seems to have been of the profession of the law, as he is styled, "of Lincolns Inn, Gent." He had two seats in the country, at Copthall in Essex, and at Bishopshall in Middlesex, to which he retired at leisure times, and employed himself with soils and manures. The book published with his name in 1594 is a thin quarto of 76 pages, which are headed "The jewel house of art and nature," and the title page bears the designation of "Diverse new sorts of soyle not yet brought into any public use, for manuring both of pasture and arable ground, with sundry conceipted practices belonging thereto." The work is without chapters, or any divisions, and forms one continued essay from beginning to end. To the books of husbandry are added—the art of moulding and casting, a new kind of fire, a boulting hutch, a portable pump, a wholesome, lasting, and fresh victual for the navy, a speedy way for mending any breach done by water, a light garment against all rainy weather, and a new conceit in peter (petre) works.

Sir Hugh Plat had correspondence with all lovers of agriculture and gardening throughout England, and discovered, or at least brought into use, many new sorts of manure, as is testified by his observation on salt, street dirt, and sullage of streets in large cities, clay, Fullers' earth, moorish earth, dung-hills made in layers, fern, hair, calcination of all vegetables, malt dust, soap-boilers' ashes, and marle. He recommended compost and covered dung-hills, but did not much enlarge on the excrements of animals, as the qualities and use were sufficiently known to every country "Corydon." He was much occupied with the nature and investigation of salts, which he made his hobby; he is an enlightened writer, and a valuable pioneer in the trenches of knowledge. Nothing seems known of his parentage, birth, or general relation in life, but he must have been of the higher class of society as his book does show. He makes frequent mention of "Maister Barnabie Googe," and must have read the work of that author. The book now mentioned had another edition in 1653; and in 1595 there was published by Plat "A discoverie of certaine English wants," 4to., London; in 1603, "A new, cheape, and delicate fire of coale balls;" in 1608, "Flores paradisæ," 12 mo., London; in 1653, "The garden of Eden," 4to., London; and "The setting of corne," in no date, or in 1600. The "Garden of Eden" contains an accurate description of flowers and fruits, seeds and herbs, trees and plants. The "Flores Paradisæ" is similarly occupied. "The setting of corne" contains eight chapters, headed as follows:—

Chap.

1. How this invention began
2. The reason why corne doth shoote up into so many eares rather by setting than by sowing
3. The manner of digging and laying of the arable grounds on this new practice.
4. The several instruments for making the holes for the grain, and covering them
5. At what depth and distances your corne must be set
6. Whether it be good to fill the holes with common earth, and prepare the seed before it be set.
7. How to make the choice of your seed corne
8. The difference of yield between the plough and the spade, with some new addition to the plough

Plat relates that the art of setting or dibbling corn, originated with a silly wench, who was employed in setting carrots and radishes, and had some seeds of wheat in the seed-bag, that were accidentally put into the holes, when the stems showed a very superior luxuriance of growth. He relates the mode and way of performing the work, and states the produce to be 15 quarters of wheat per acre, and in the old way of sowing to be only 4 quarters. This estimate shows a practical ignorance of the constitutional ability of any soil, which the author's rank in life had not condescended to ascertain. The treatise on setting corn, is without date, title, or printers name; but "H. Plat, Esquire," is printed at the end.

X.—Hill, 1593.

Thomas Hill, Hyll, or Hylle, was a citizen of London, and wrote a number of books on various subjects. In 1563 there was published by Thomas Hyll, Londoner, "The profitable art of gardening, to which is added much necessarie matter, and a number of secrets, with the phisicke helps belonging to each hearbe, and that easily prepared." And "A profitable instruction of the perfite ordering of bees, with the marvellous nature, property, and government of them, and the necessary uses both of their honie and wax; to which is annexed a treatise intituled—certaine husbandrie conjectures

of dearth and plenty for ever, and other matters also meet for husbandmen to know." These two works were printed together, and separately, and the best edition appeared in 1593, of the two works in one volume, which is the copy in the British Museum, and of it the date is here used.

The books are printed in black letter, with the heading, prefaces, and titles in the modern type. Weston dates the publication of the works in 1574, and in his list of authors on husbandry, gardening, botany, natural history, and subjects relative thereto, Hyll's two books seem to be first that were written on gardening and bees, and this priority entitles the contents to be given at length.

The gardening is in two books.

The first booke teacheth the skilful ordering and care to be bestowed on gardens, with necessary helpes, defences, and secrets.

The second book instructeth diverse manner of sowing, setting and ordering of the most pot hearbes, floures, &c., with the care and secrets taught, as well for the health of the bodie, as to the pleasure and delight of the eie.

BOOK I.

Chap.

1. What three points are to be learned of every gardner minding to have a fruitful garden —the health that may be recovered by walking in the same, and the commodity of gardens placed neere to a citie
2. Of the standing of gardens, the water necessarie to them, and of the properties of the ground with the qualitie and temperateness of the aire, and condition besides of the windes
3. Of the consideration and choosing out of good and excellent ground, and the knowledge of every earth
4. How a garden may diverse waies be fenced and inclosed—the manner and secret in making a lively and strong hedge
5. Of the first maze
6. Of the dung and dunging of gardens, with the digging, dressing, levelling, and disposing of the quarters and beds
7. Of the second maze
8. Certaine precepts and rules of ancient men, both in the choise and proper sowing of seedes
9. Of the times in sowing and proper ordring of seedes, with the watring and weeding of the yong plants in the coming up—the divers manner of removing and setting againe of the hearbs somewhat growen upp
10. Certaine helpes and secrets for the garden seeds, as well before as after sowing them, that they may not be harmed by any inward or outward means
11. Certaine special times to be noted and observed, either for their aid or savour to be chosen, or for their annoyance and incommoditie to be eschewed for sowing, planting, or graffing
12. Certaine helpes and secrets against haile, lightning, tempests, mistes, rust, frosts, and burning heat
13. Certaine helpes and secrets against the garden woormes, the greene flyes, the canker woormes, the great moths, and snayles with shelles and without shelles, that harme and gnawe as well the leaves of trees and fruites, as the hearbes and young plantes coming up
14. Certaine helpes and secrets against the garden moles, pismires, gnats, flies with the long hinder legs, breses, field mice, backes, serpents, frogs, and todes, which gnawe, harme, and destroy, as well the trees and fruites, as other hearbes and floures.

BOOK II.

1. Of the ordring, care, and secrets of the lettuce
2. Of the ordring, care, and secrets both of endive and succory
3. Of the ordring, care, and secrets of the hearbe blete
4. Of the ordring, care, and secrets of the hearbe spinage
5. Of the ordring, care, and secrets of the orach, or arage
6. Of the ordring, care, and secrets of beetes
7. Of the ordring, care, and secrets of coleworts
8. Of the ordring, care, and secrets of the land cresses
9. Of the ordring, care, and secrets of the parcely
10. Of the ordring, care, and secrets of sperage
11. Of the ordring, care, and secrets of savory
12. Of the ordring, care, and secrets of the running time
13. Of the ordring, care, and secrets of the Lombardy lovage
14. Of the ordring and care of the greater or garden mallowes
15. Of the ordring, care, and secrets of fennel
16. Of the ordring and care of the annis
17. Of the ordring, care, and secrets of commine
18. Of the ordring, care, and secrets of the coliander
19. Of the ordring and care of the mustard seedes
20. Of the ordring and care both of the chervil and caper
21. Of the ordring and care of the hearb dill
22. Of the ordring, care, and secrets of rue
23. Of the ordring and care of the hearbe isope
24. Of the ordring and care of the mints
25. Of the ordring and care of the garden time
26. Of the ordring and care of the hearbe organie
27. Of the ordring, care, and secrets of violets
28. Of the ordring, care, and secrets of all roses
29. Of the ordring, care, and secrets of the hearbe basil
30. Of the ordring, care, and secrets of the sweete marjoram
31. Of the ordring, care, and secrets of the marigold
32. Of the ordring and care of the lavender
33. Of the ordring and care of the spikenard
34. Of the ordring, care, and secrets of the white lillie

35. Of the ordring, care, and secrets of the wood lillie
36. Of the ordring and care of the fleur-de-luce
37. Of the ordring, care, and secrets of the pionie
38. Of the ordring and care of the white poppie
39. Of the ordring, care, and secrets of the floure petilius
40. Of the ordring and care of the velvet floure, or floure armour
41. Of the ordring, care, and secrets of the gili-floure
42. Of the ordring and care of the strawberries
43. Of the ordring and care of the borage, and also of the buglosse
44. Of the ordring and care of rosemarie
45. Of the ordring and care of the hearbe germander
46. Of the ordring and care of the blessed thistle
47. Of the ordring and care of the hearbe wormwood
48. Of the ordring, care and secrets of sothernwood
49. Of the ordring, care, and secrets of the hearbe sage
50. Of the ordring and care of the purselaine
51. Of the ordring and care of the pennyroyal
52. Of the ordring, care, and secrets of the artichoke
53. Of the ordring, care, and secrets of leekes
54. Of the ordring, care, and secrets of the garden onyon
55. Of the ordring, care, and secrets of the garlicke
56. Of the ordring, care, and secrets of the great garlicke
57. Of the ordring, care, and secrets of the radish
58. Of the ordring, care, and secrets of the navew
59. Of the ordring, care, and secrets both of the parsnip and yellow carrot
60. Of the ordring, care, and secrets of the mellons and all kinde of pompions
61. Of the ordring, care, and secrets of the cucumber
62. Of the ordring, care, and secret of the gourd
63. Of the ordring and care of the beane of Egypt
64. Certaine necessary precepts in the cutting up, plucking away, gathering, and preserving of the most hearbes, flewers, seedes, and rootes, serving especiallye to medicine.

This work reaches to 164 pages of small quarto size.

The book on the perfite ordering of bees, with the annexed treatise, contains 92 pages of the same size as the work on gardening; the contents are:—

Chap.
1. Why bees are named to be creasted or parted betweene, or as it were tinged, or rather pleighted—what work the swarme newe gathered in the hive do first take in hand, and whether they may live after their stinges are gone
2. Who first taught the preparation and increasing of bees, and found out the use of honye

Chap.
3. How bees do naturally engender
4. Of the imperfecte bees, which man properly name droane bees
5. Whether the bees draw breathe, or have any blood within them
6. Of the great utilitie and profite of bees to mans use
7. Of the care and diligence of bees
8. Of the marvellous government of the king of bees, and of the obedience which they use to him
9. What kind of bees be best, and rather to be chosen
10. Where hives of bees ought especially to be placed
11. What things bees do chiefly abhor and greatly hate
12. By what signes men may knowe when the bees are diseased, and how they may be cured
13. What manner of person the keeper of bees ought to be
14. By what means the swarme cometh forth, and may be preserved when flying away
15. Of the bees newe setled in a swarme together, and taken and recovered againe
16. Which are the best and fittest hives for bees
17. Of the cleanlinesse and sweetenes of the keeper of bees, and how the hives ought to be fenced about and prepared within
18. How bees lacking honye may be fed in the time of their necessitie
19. How the dead bees may be restored to life again
20. Of the battailes that bees have sometimes amongst themselves
21. How bees lost may be recovered and form againe
22. That the bees stingeth no person that commeth neare to their hives
23. What the honye is, and how from the hives the same may be prepared for use
24. When and how the hives ought to be gelded
25. What honye is accounted best
26. Of the vennomous honye, and of the wonderfull honye of Creta
27. Of the miraculous worthinesse of honye
28. How profitable the use of honye is in medicine
29. Of the drinke of honye, which they call the mulse water, or sweete water of the Romaines
30. Of the drinke oenamell, which is made of pure wine and honye
31. Of the singular water of honye gotten by distillation
32. An other manner of distilling the honye, more at large taught
33. The manner of distilling a water from honye named the quintessence
34. The manner of drawing and making wax of the combes
35. What waxe is best allowed, &c.
36. Of the great commoditye and benefite of waxe in medicines
37. How to make waxe white

Chap.
38. Of that which is a staye of the combes, and made for a defence of bees
39. How to make rede waxe
40. How to drawe a very profitable oyle out of waxe, for sundry uses
41. Another way of drawing the oyle of waxe most noble, and doth marvellously helpe the cold gout, the sciatick, the swelling of the legges, and all other griefs of a cold cause.

The additional treatise contains :—

Chap.
1. Certaine husbandrie conjectures of dearthe and plenty for ever
2. An everlasting prognostication of the state and condition of every yeare, by the onely kalends of Januarie, written by the ancient and learned Leopol. Aust., and other for the commoditie of the wise husbandmen
3. How to foreknow the state of the yeare by the only rising of the dogge starre, out of the husbandrie of Diophanes
4. Other profitable instructions right necessarie for husbandmen to know
5. A most profitable rule for the preservation of mans health throughout the twelve months of the yeare, after the mind of divers learned men of the university of Padua
6. Of the falling sick on any of the week daies, out of that anciente phisition Hippocrates
7. Of those manifest signes which declare raine to follow
8. Of those manifest signes which declare faire weather to follow.

The booke of the art or craft of planting and graffing concludes the volume, and contains the following heads of matter :—

To graffe frute that shall have no core
To make apples red
To make a pear tree beare much frute
To revive an old tree that is decayed
How to make us our frute tree bring forth sweet frute
The ordring of an almond tree, walnut tree, cherry tree, and peach tree
How to nourish the peach tree if it begin to wither
How to water plants when they wax dry
The ordring of the apple tree
The ordring of the quince tree
The ordring of the cherry tree
At what time prunes ought to be planted
How the medler ought to be planted
The sowing of roses in a garden
How to plant white grapes
How to set vine plants two and two together
To make grapes grow on a plum tree or cherry tree
The best times to plant and graffe in
How to set all manner of peppins, kernels, and grains in the earth
Of the manner and changing of the frute of the pepin tree
How you make an orchyard in few years
How you ought to set the pine tree
To set damsons or plum trees
How to remove a setting
How to remove a great tree
How to keep late set plants
How you may keep cherries good a yeare
How you may set chesnuts
The order how to plant or set trees at large
The best way to clense and proine, or dresse the rootes of trees
The manner of graffing
How to graffe divers frutes on one stocke
How to groffe all sorts of trees
How to graffe apple trees, quince trees, pear trees, and medlar trees
How to chuse your trees for graffes
How you may keepe graffes a long time
To have frute without cores
After what manner ye ought to begin to graffe
How to trimme your graffes
How to graffe vines on cherry trees
To make a tree beare divers frutes.

This notice of Hyll's book may seem long for the occasion, but being the first publication on the subjects, a curiosity arises to see the original conceptions that were entertained, and the manners that prevailed of arranging the materials. Hyll's book is an interesting relic, and will be perused with pleasure by every lover of the two subjects that are treated. Bees are the farmer's object in some degree, and accordingly a place has been given in our agricultural record to the first publication on the care and management of the insect.

XI.—Churchy, 1599.

G. Churchy, of Lyons Inne, wrote a work entitled "A new book of good husbandrie." This statement is taken from Weston's catalogue of writers, who alone mentions the name. No author or work of that title is found in the "Bibliotheca Britannica," nor in the catalogue of books in the British Museum, nor in George the Fourth's library. The late Mr. Loudon has not mentioned any author or work of that name.

XII.—Surfleet, 1600.

Richard Surfleet, Practitioner in Physicke, wrote "The countrie farme." It is said he only translated the "Maison rustique," a French work of Charles Stevens; while others contend that he composed it himself. The book is not now found, and the author's name is rarely known.

XIII.—Massie, 1606.

Massie, or Maxie, is stated by Weston to have been the author of "A treatise on drilling corn, in 4to." His is the only authority, as no book on agriculture under that name as an author is found in any other catalogue of authors or books. Our search was eager to see the ideas of drilling corn at that early period of agricultural practice; but the disappointment was complete. Weston quotes many otherwise unknown authors.

XIV.—Norden, 1607.

John Norden was born of a genteel family in the county of Wilts, about the year 1548. He became a Commoner of Hart Hall in 1564, and took the degree of arts, that of master being completed in 1573. He was patronized by, or was servant to, William Cecil Lord Burleigh and Robert Earl of Salisbury, his son. He lived beyond the year 1624. Weston styles him Sir John Norden, but no other account exceeds John Norden, Gent.

Norden is chiefly known from a publication entitled "The Surveyor's dialogue, very profitable for all men to peruse, but especially for gentlemen, farmers, and husbandmen, &c., in 6 books." It passed through three editions, in 1607, 1610, and in 1618, in 4to. It forms a thick volume, being printed and bound with "A discoverie of sundrie errors and faults committed by land-meaters, by Edward Worsop, Londoner, 1582;" and "The most profitable and commendable science of surveying lands, tenements, and hereditaments, by Valentine Leigh, 1577;" and "Epitome of surveying methodized, by W. Folkingham, 1610." These works are scarcely agricultural; yet, as a book or chapter is generally devoted to the improving and bettering of lands, the names are given in lists of authors. The fifth book of Norden's dialogue is, "Shewing the different natures of grounds, how they may be employed, bettered, reformed, and amended." Similar notices are made by the above-mentioned authors.

Norden was an ardent tradesman, and laboured very extensively. He wrote "A topographical and historical description of Cornwall, and of Middlesex, and of Hertfordshire, and of the County of Northampton; and a guide for English travellers, showing the distances of towns, and the respective directions." The surveys were much esteemed at the time, and were well executed. He also surveyed Berks and Surrey, but never published the works. He is said to have been much devoted to theological studies, and combined both the surveyor and the divine. Several works of a highly moral and religious character have been attributed to John Norden. The similarity of expressions in the surveying and theology almost identify the author. He was much esteemed, but was little provided for, and had many tokens of respect from the highest quarters of society.

In "The surveyor's dialogue" the person who answers the questions is termed "Surveyor," and to be understood as the anthor himself. The replies show a full readiness of subject, and very enlarged and enlightened views on every point that is discussed. Learning was at that time not much advanced, and Norden must have been a very superior person.

The printing of old English characters was not at that time wholly disused, as, in "The surveyor's dialogue," the questions are printed in the Saxon characters, and the reply in the Roman type; but the custom was fast giving way. The labour of reading was very much reduced by the introduction of the Roman characters, and the speed of knowledge was accelerated.

XV.—Butler, 1609.

The Rev. Charles Butler, M.A. of Magdalen College, Oxford, wrote "The feminine monarchie; or, the history of bees," 4to. London: 1609, 1623, and 1634. Also, "The principles of music in singing and setting." "The English Grammar," in 1633; and, in 1625, the "De regula de-propinquitate matrimonium impediente." The book on bees had previously been one in the smaller form of duodecimo, and had been well received. The work now quoted is entitled "The feminine monarchy, or the histori of bees, shewing their admirable nature and properties, their generation and colonis, their government, loyalti, art, industri, enemis, wars, magnanimite, &c.; together with the right ordering of them from time to time, and the sweet profit arising thereof." Written out of experience by Charles Butler, Magd. The contents are largely illustrated with figures of hives and stools, and filled with quotations from every author on the subject. The contents are in ten chapters:—

1. De first—of de nature and properties of bees and their queen.
2. De second—of de bee-garden, and seats for hives.
3. De third—of de hiv's, and de dressing of them.
4. De fowrt—of de breeding of bees, and of de dron.
5. De fift—of deir swarming, and de hiving of them.
6. De sixt—of deir work.
7. De sevent—of deir enemies.
8. De eight—of feeding dem.
9. De nint—of removing dem.
10. De tent—of de fruit and profit of dem.

The language and orthography of Butler are most peculiar, and much more antiquated than in the time of Fitzherbert. His poetry is shown as under:—

For, if old tim's admir' Callicrates
For ivori emmets—and Mermecides
For framing of a rigged ship so small
Dat with hir wings a bee can hid' it all—
Admir' we then d' All wise Omnipotenc',
Whi' doo't within so narrow spac' disperc'
So stiff a sting, so stout and valiant hart,
So loud a voyc', so prudent wit and art;
Deir wel rul'd stat' my sowl so mu' admir' it,
Dat, durst I loos' the rein of my desir's,
I gladly cool'd digres from my design,
To sing a whil' teir sacred disciplin'.

In the chapter of hiving bees from swarming, the author has set to music the "Melissomelos," or the bees' madrigal, beginning "As of all stat's the monarchie is best," and extending to four pages, in mean, tenor, contra-tenor, and bassus. The author thinks that all orderly processions, with outriders and trumpeters leading the van, have been copied from the bees, as in swarming the best attired go foremost, the queen in the centre, and a motley multitude bring up the rear. He was fully sensible that a large part of human knowledge has been derived from the brutes, and his book shows the work of an educated person treating scientifically a subject of great value and of a large curiosity.

XVI.—Vaughan, 1610.

Rowland Vaughan, Esquire, wrote a work entitled "Most approved and long experienced water-works, containing the manner of winter and summer drowning of meadow and pasture, by the advantage of the least river, brooke, fount, or water-rill adjacent, thereby to make those grounds (especially if they be drye) more fertile ten for one."

As also a demonstration of a project for the great benefit of the commonwealth generally, but of Herefordshire especially.

The author dedicates his "watry" workmanship to the Earl of Pembroke, and thinks it was forbidden to former creatures to handle the subject. He had been of Queen Elizabeth's court, afterwards served in the Irish wars, and then retired to his father's home in the county of Hereford. He again served in the low country wars, and, at last marrying, he retired to a country life. The book is one continued essay, which the author calls "The manner of my drownings," and extends to 114 pages of small octavo. The author had observed the casual effects of water on the growth of grass, and he employed it by artificial directions. His proceedings did not extend beyond leading one main trench to convey water from a stagnant river, or from a dam constructed for the purpose; but his book and practice are the first notice of watering lands in British agriculture.

XVII.—Folkingham, 1610.

W. Folkingham, Gent., wrote a book called "Epitome of surveying methodised," 1610. It is bound along with Norden's "Surveyor's dialogue," and the "Treatises on surveying," by Leigh and Worsop. He also wrote "A compound ale, which is a generall purge and generous medicine;" London, 1623, 12mo. And, "Brachigraphy; or, the art of shorte-hand writing," 8vo. The synopsis of surveying is styled "Feudigraphia, or epitome of surveying methodised, anatomizing the whole corps of the facultie, viz., the materiall, mathematicall, mechanicall, and legal parts." There are four sections of 88 octavo pages, treating the materials of possession, as earth, water, quarries, mines, situation and residence of grounds, measuring and plotting, natures and properties, tenures, rights and fees, issues, rents, privileges, and other accruements, marshalling and digesting the whole survey in field entries, rough books, and engrossing.

The art of survey is distinguished into two parts, active and passive: the former being the feudigrapher, which consists in operation and estimation; the latter relates to possessions, as they consist of parts essential and accidental. In the ideas of this author are found the germs of the gross rental, entry and observation books that are now kept by the agents on extensive landed estates.

XVIII.—Gooch, 1614.

Bernard Gooch wrote "The whole art of husbandry," London, 1614, 4to., which treats of lands, gardens, woods, and orchards. This statement is taken from the "Bibliotheca Britannica." No author of that name is mentioned in any other list of authors, nor in the catalogues of books in the British Museum. Weston writes the same title of Barnaby Googe's work, reprinted in that year from the revising care of Markham. It may have happened that the "Bibliotheca Britannica," having seen the title of the work, has written mistakingly the christian name and surname of the author, as Bernard Gooch differs not very widely from Barnaby Googe. The former name not being found in any other place renders this conjecture very probable.

XIX.—Rathbone, 1616.

Aaron Rathbone wrote "The surveyor," in four books, in folio. The first book treats definitions, theorems, and approved truths of geometry; the second contains geometrical problems; the third applies the foregoing books to measurement of lands, with the use of the instruments, the theodolite, plain table, and circumferentor; the fourth book is the legal part, and contains what the manor is, the perquisites, casualties, and profits, in fines, heriots, reliefs, escheates, and forfeitures; in tenures by fee-simple, fee-tayle, courtesee, issue extinct, in dower, term of years, and by tenant at will. Rents and reprisals are largely treated, and the manner of holding the various kinds of feudal courts. Examples are given of the surveys of townships, arranged on the left and right hand sides of the book, in the nature of perquisites, with the observations and particulars. The work seems the most valuable of the kind that was possessed by those times.

XX.—Speed, 1626.

Adam Speed, Gent., wrote "Adam out of Eden; or, an abstract of divers excellent experiments touching the advancement of agriculture;" London, 1626, 1659, 12mo. And also, "Husbandman, farmers', and graziers', compleat instructor;" London, 1697, 12mo. The first work only is found in the British Museum, and is in a small duodecimo of 180 pages, in 31 chapters, which are parted into observations, as Observ. 1, 2, 3, &c. The first chapter sheweth how ground may be raised from the value of £200 yearly to the sum of £2,000 by means of rabbits, which are to be kept in fed enclosures, and indulged with the shelter of sown furze and broom. The calculations mount rapidly, as does the pen of every theorist on the paper, where it meets no obstacle of progress. The author knew turnips and potatoes, and mentions their culture and use. Clover grass is noticed in connection with the name of Sir Richard Weston, who brought the plant from Flanders. Hops and flax are briefly noticed. To fatten fowls and all poultry, "Boil butcher's blood with bran or grains into the consistence of a pudding, which feed the beasts very fat; also, boil carrots, turnips, and parsnips with bran or coarse pollard; and give acorns bruised to fatten turkies; soak crusts and chippings of bread in beer or milk, which will quickly fatten capons and hens." The author makes frequent mention of Sir Richard Weston, Hartlib, and Mr. Plat—meaning, no doubt, Sir Hugh Plat, already noticed. Mr. Speed must have been in respectable society, though no intelligence can be got of his birth and parentage.

The following quotation from Speed shows that rural poetry had not much improved since the days of Tusser.

"A digression to the usage of divers countries concerning the tillage.

Each soyl hath no liking of every grain,
Nor barley nor wheat is for every vein:
Yet know I no country so barren of soyl,
But some kind of corn may be gotten with toyl.

Though husband at home be to count the wot what,
Yet thus huswife within is as needful as that:
What helpeth in store, to have never so much,
Half lost by ill-usage? ill huswife's and such."

XXI.—Markham, 1631.

Gervase, Gervas, or Jarvise Markham, was the youngest son of Robert Markham, Esquire, of Gotham, in the county of Nottingham. He bore a captain's commission in the army of Charles I. during the civil wars, and was accounted a good soldier, as well as a good scholar. The time of his birth, death, and also the other particulars of him, are utterly unknown.

Markham was a very voluminous author, and is thought to have been the first hackney writer in England, or a person that writes for hire. The agricultural works only are to be noticed here—"The English husbandman," in two parts; London, 1613, 1635. "Farewell to husbandry, or the enrichment of all sorts of barren ground;" London, 1620, 4to. "Cheap and good husbandry, for the well ordering of the beasts and fowls;" London, 1626, 1631, 4to. "Enrichment of the Weald of Kent;" London, 1620, 1631, 4to. "The country farmer;" London, 1616, folio. Markham wrote largely on horsemanship, horses, their management and diseases. His works were in much repute, and often reprinted.

Markham died in 1636, and is supposed to have been born about the middle of the preceding century, as, when in the prime of life, he was champion and gallant of the Countess of Shrewsbury in 1591, and dangerously wounded in a duel by Sir John Holles. He was a portionless son, and encountered the usual unsettled life of that class of the patrician order of society. He is said to have been a good scholar, being perfect master of the French, Italian, and Spanish languages, and cultivated the muses at an early age. He wrote, or assisted in writing, a tragedy called "Herod and Antipater;" and "Sion's Muse, or Song of King Solomon," in eight eclogues, in 1596. The levity of this song gave great offence to the Puritanical clergy, who loudly censured Markham by name, and some information has placed his character in rather an equivocal light. The works on horses show that the author delighted much in rural masculine sports, and was a gallant courtier.

Markham published, in 1616, the "Country farm, or Maison rustique of Liebault," which was first translated by Surfleet, who has been already noticed. It was enlarged by Markham, with quotations from Spanish and Italian authors. He also edited a publication of the works of Barnaby Googe. His ideas of rotation of crops were nothing advanced beyond the days of Fitzherbert, as he advises two grain crops in succession, and another grain crop after a manuring of the land by folding of sheep. He recommends the use of earthy manures, as marl and chalks. It appears that his works on husbandry were once held in great esteem, as may be judged by the following agreement between him and the Stationers' Company, which may have arisen from the booksellers' knowledge of the value of Markham's works, and their apprehensions that a new performance of the same subject might be hurtful to the treatises then circulating. It is as follows:—

"Md.—That I, Gervase Markham, of London, Gent., do promise hereafter never to write any more

book or books to be printed of the diseases or cures of any cattle, as horse, oxe, cowe, sheepe, swine, and goates, &c. In witness whereof, I have hereunto sett my hand, the 24th day of Julie, 1617.

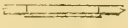
"Gervis Markham."

The name of Markham is always put forth as a leading author in the history of British agriculture. He was an educated person, and thereby qualified to take a comprehensive view of the subject, and to range it beyond the narrow sphere of the common entertainments. Markham lived in the commencement of the civil commotions in Britain, but did not see the fruits of the agitation; his was a generation that did not partake the vast influx of altered knowledge which burst upon every department of human employments from foreign intercourse, and the enlargement of the human mind from the spread of education. His "Farewell to husbandry, or the enrichment of all sorts of barren grounds," forms part of a thick octavo volume of "Tracts on agriculture," printed in 1620. It is divided into seventeen chapters, containing 160 pages, along with the works of Leonard Mascall on planting and graffyng. The general directions improve arable lands by means of earthy manures, and grassy lands by watering and top dressing. The "English husbandman" is drawn into two books: one on the knowledge of husbandrye duties, the nature of all sorts of soils, the manner of tillage, the diversity of ploughes, and all other instruments; the second part contains the art of planting, grafting, and gardening, the use of vines, the hope garden, the preservation of all sorts of fruits, the draught of all sorts of mazes, knots, and other ornaments; printed in 1635. The third chapter is entitled "Of the situation of the husbandman's house, the necessaries thereto belonging, together with the model thereof." The following model is copied from the booke, and forms a curious illustration of the ideas of those times anent the farmer's accommodation, among the better classes of society in which Markham moved.

The following plan is given by the author for the use of the plain husbandman, and not to please men of dignity, and is explained as follows:—

A. Signified the great hall.
B. The dining parlor for entertainment of strangers.
C. An inward closet within the parlor, for the mistress's use for necessaries.
D. A stranger's lodging within the parlor.
E. A staircase into the rooms over the parlor.
F. A staircase into the goodman's rooms over the kitchen and buttery.
G. The skreene in the hall.
H. An inward cellar without the buttery, which may serve for a larder
I. The buttery.
K. The kitchen, in whose range may be placed a brewery lead and convenient ovens, the brewing vessels adjoining.
L. The dairy-house for necessary business.
M. The milk-house.
N. A faire sawne pale before the foremost court.
O. The great gate to ride in at the hall dore.
P. A place where a pumpe would be placed to serve the offices of the house.


This figure signifieth the dores of the house.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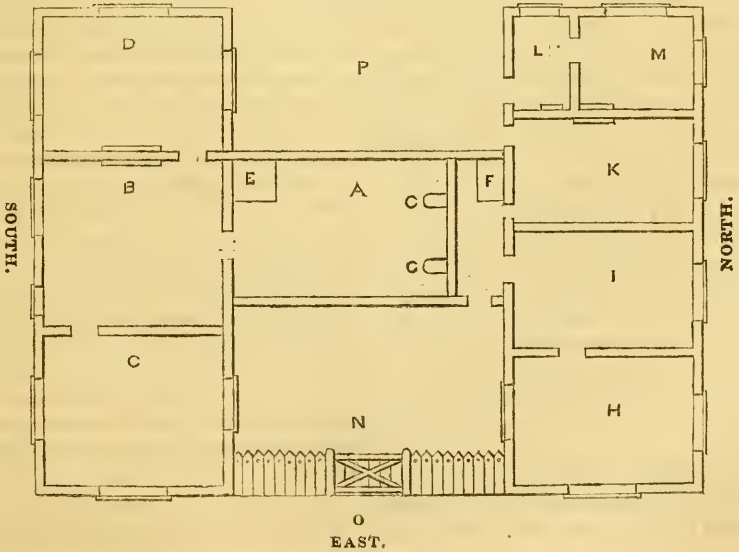


The garden and orchard are planted on the south side of the house; the west yard contains a pond of water and a gravelled court; on the north side are the farm buildings, as stables, ox-house, cow-house, and swine cotes, the doors and windows all opening to the south. On the south side of the base court are built the hay barnes, corne barnes, houses for hens, ducks, and geese; and over crosse both these sides are hovels for pease, of good and sufficient timber, and beneath are stowed the cart, wayres, tumbrels, ploughes, harrowes, and such like, together with plough, timber, and axle-trees, in order to be kept dry, as wet doth soon rot and consume them. The house is built of timber in the walls, or of stone and lime, or of studde and plaster, covered with lime and hair. Bay windows are much recommended, and turrets to be raised in the corners.

Figures are given of ploughs with very short handles; the plough is given with two wheels on the end of the beam as now used, and recommended for level lands of a light sandy soil. The mould-board is square: the upper side extends from the middle of the coulter which it touches, to the hind body of the plough. The harrow is very similar to the present implement of that name: the width exceeds the length. The roll is a curiosity: the shafts of draught are attached to each end, and are narrowed in front to a width of the horse's action, where the animal is attached; the material is wood, and thirty inches in girth.

A large portion of the writings on rural subjects in the times now mentioned consisted in the managements of trees, fruits, and orchards. These objects had preceded the practice of agriculture, but gradually shrunk into the legitimate sphere according as the cultivation of land was extended. Markham occupies less room in this way than the preceding writers; but his ideas do not seem to have led any advance in the progress of improved practice. He appears to have known the routine then followed, and nothing more.

At the date in which we write the old English type had disappeared from printing, and Markham's works are wholly in Roman characters.

ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

The meeting of the Royal Agricultural Improvement Society of Ireland took place 19th August. We submit a list of the prizes; but we are compelled, from want of space, to postpone our report of the speeches at the "Banquet Dinner" until our next. As announced in the Programme, "the local Committee, Members of the Society dined together in the Saloon of the Railway Hotel on the Wednesday. The Judges of the Show were invited to attend." About seventy persons sat down to dinner. The Duke of Leinster, who occupied the chair and several of the gentlemen immediately around him left the room as soon as the cloth was removed, no toasts being given, and consequently no speeches made. Those who remained (about two-thirds of the number) requested Wm. Dargan, Esq., to take the chair, with which request he obligingly complied, when several toasts were given and responded to in a manner and with a spirit highly creditable to the speakers. It would, perhaps, be unreasonable to expect that a show of animals and implements at the extreme west of Ireland—the "next parish to America"—should be of any magnitude, and hence we refrain from saying more than that it did not realize our expectations.

It will be seen that the best prizes, medals and the "Purcell Cup," were carried off by English animals; some of the first prizes were, nevertheless, awarded to Irish breeders for animals which did them great credit. We may here observe that the award of the first prize to Mr. Chrisp's bull, both at the Highland Society's Meeting and at the Galway Meeting, will effectually silence those parties who were disposed to cavil at the decision of the judges at the Lewes Meeting of the Royal Agricultural Society of England. Mr. Carter, who, as we are informed, has already been a successful exhibitor at several of the Agricultural Shows in the northern part of England, further distinguished himself at Galway by carrying off four prizes for Leicesters. Of the purely native breeds of animals, the Irish sheep deserve great praise, and might be considered as one of the best, if not altogether *the best*, feature of the Show. The Kerry kine were superlatively represented by a cow of that breed, exhibiting milking properties which would have done credit to an animal double or treble her size. Amongst the swine it will be seen that the Berkshire breed was eminently successful. Looking at the character of the district in which the town of Galway is situated, it may safely be affirmed that the Royal Agricultural Improvement Society of Ireland has brought information home to the doors of the farmers in that locality which they otherwise could not readily have obtained.

(FROM THE FREEMAN'S JOURNAL.)

GALWAY, Thursday, Aug. 19.—The contributions in

the agricultural implement portion of the exhibition are not, comparatively with previous agricultural shows, extensive. There is a very fair variety of implements, but very few inventions that can be said to be quite new. Some, however, may be entitled to notice on this occasion, although, perhaps, already not altogether unknown to some of the public interested in such matters. A good deal of attention appeared to be attracted by a cart and cattle weighing machine (by Messrs. Smith, Paisley), so constructed as to be self-contained, being furnished with a cast-iron case, and thus saving the expense of stone work, &c., &c., in putting it up. It is also of small bulk, but capable of indicating from 1lb. to 2 tons.

A machine for sowing turnip seed, with guano or other portable manures, was exhibited by Mr. Ritchie, of Ardee. It appeared to be exceedingly light of draft and of simple construction. The same contributor had a specimen of a farm tumbling cart with improved harvest frame, and with self-acting locker—the latter a very great desideratum in such vehicles.

Mr. Frazer, of Mary-street, Dublin, had a vast variety of articles on exhibition. Amongst them we noticed a "sack-lifter," presenting an extremely simple means of expediting barn or granary work, at the same time effecting a considerable saving in labour and expense; also a pulping-mill, constructed of galvanized iron, and used for pulping turnips for cattle, swine, or poultry feeding, in the most expeditious manner; likewise for reducing diseased potatoes to farina. Much public favour appeared to attach to the same inventors' improved oak churns.

Several field implements were contributed by English establishments; but, as it struck us, mostly of a character too heavy or too expensive to be adopted generally in this country.

Yesterday the performance of Hussey's American reaping machine was tested here. The operation took place on a crop of wheat, rather light, and all standing in very nice order. The pair of horses to the machine, untrained, of course, to such work, did not execute their portion of the task in a manner at all satisfactory. At times they became restive, plunged, and became almost unmanageable. This, of course, untirely upset the work for the time, but during the intervals that they happened to draw kindly the cutting was beautifully executed, and with surprising expedition.

There were a good number of agriculturists present, and different opinions prevailed, but the majority appeared in favour of the machine.

At two o'clock, his Excellency and the Countess of Eglinton visited the exhibition, and remained for a considerable time, continuing from the previous day their inspection of the various objects in the show-yard.

The following is the list of the prizes read at the banquet:—

SHORT-HORNED.

For the best bull calved on or after the 1st of January, 1847, and previous to the 1st January, 1850, 30 sovs.—Thomas Crisp, Hawk Hill, Alnwick, Northumberland, Phœnix, 1848, got by Ronald, d. by Guy Faux, g.d. Young Red Duchess, by The Peer.

For the second best ditto, 10 sovs.—A. F. Nugent, Pallas, Tynagh, short-horned bull, Bamboo, calved 10th January, 1847, bred by the exhibitor, got by The Beau of Killerby, d. Bustle, by Windle, g.d., Beauty by Monarch.

For the best bull calved in 1850, 20 sovs.—Lord Clonbrock, Clonbrock, Ahascragh, roan bull, Demalion, calved April, 1850, bred by Mr. Hincks, of Breckenbrough, got by the Duke, d. Duchess, by the Duke of Cornwall, gd. Datura, by Mowbray.

For the second best ditto, 5 sovs.—Thomas Ball, Robert's Walls, Malahide, short-horned bull, Sol, calved 11th February, 1850, bred by Wm. Torr, Esq., of Aylesby Manor, Lincolnshire, got by Vanguard, d. Solar Ray, by Leonard, gd. Sunshine, by Remus, ggd., by Prince Comet, gggd., by Cornet.

For the best bull calved on or after the 1st January, 1851, 10 sovs.—Thomas Ball, Robert's Walls, Malahide, short-horned yearling bull Emerald, calved April 17, 1851, bred by the exhibitor, got by Blunder, d. Lily, by Comus, gd. Fairy Queen, by Coriander, ggd. Princess, by Young Napoleon, gggd. Adelaide, by Match-'em.

For the second best ditto, 5 sovs.—The Earl of Clancarty, Garbally, Ballinasloe, short-horned yearly bull Snowdrop, calved 25th September, 1851, bred by the exhibitor, got by Cowboy, d. White Rose, by Mayboy, son of Second Comet, gd. Chamber.

For the best bull in the above sections, the medal.—Thomas Crisp, Hawk Hill, Alnwick, Northumberland, short-horned bull Phœnix, calved 28th March, 1848, bred by exhibitor, got by Ronald, d. by Guy Fawkes, gd. Young Red Duchess, by the Peer.

For the best cow in calf, or that has had a calf in 1852, 15 sovs.—A. F. Nugent Pallas, Tynagh, shorthorned cow Maid of Killerby, calved March 26, 1847, bred by exhibitor, got by The Beau of Killerby, dam by Sir Thomas Fairfax, gd. by Wallace.

For the second best ditto, 5 sovs.—John J. Turner, Newtown Villa, Kilcullen, shorthorned roan cow Grandiflora, calved 18th May, 1848, bred by exhibitor, got by The General, dam Young Prize, by Narcissus, gd. Old Prize, by Prince Paul, ggd. Beauty, by Planet, Cinderella, by Magnet; had a calf 22nd April last.

For the best heifer in calf or in milk, calved in the year 1849, 10 sovs.—Charles Towneley, M.P., Towneley Park, Burnley, Lancashire, shorthorned heifer in milk Butterfly, calved 1st of May, 1849, bred by exhibitor, got by Jeweller dam Buttercup, by Garrick, gd. by Expectation.

For the second best ditto, 5 sovs.—A. F. Nugent, Pallas, Tynagh, shorthorned heifer Baby, calved 8th January, 1849, bred by exhibitor, got by Rockingham, dam Bustle, by Windle, gd. Beauty, by Monarch.

For the best heifer in calf or in milk, calved in the year 1850, 10 sovs.—A. F. Nugent, Pallas, Tynagh, shorthorned heifer Muslin, calved Feb. 7, 1850, bred by exhibitor, got by Bamboo, dam by Albion, gd. by Ury.

For the second best ditto, 5 sovs.—John Wm. O'Meagher, Beaumont, Tullow, shorthorned red and white heifer Dimple, calved 8th July, 1850, bred by J. D. Trotter, Esq., county of Durham, got by the Duke of Richmond, dam Dulcimer, by Second Duke of Northumberland, gd. Dulcimer, by Clarion; in calf to Homespun.

For the best heifer, calved on or after the 1st of January, 1851, ten sovs.—Charles Towneley, M.P., Towneley Park, Burnley, Lancashire; shorthorned yearling heifer Frederachia, calved January 3, 1851, bred by exhibitor, got by Upstart, dam Feathers, by the Duke of Cornwall, g.d. Lily, by Fergus.

For the second best ditto, five sovs.—St. George Grey, Dorrington, Glasson; short-horned yearling heifer Lady Harris, calved May 27, 1851, bred by exhibitor, got by Lord John,

dam Harriet, by Sir J. Sinclair, g.d. Rose de Meaux, by Collard.

OTHER LARGE BREEDS.

For the best Devon bull, calved on or after the 1st of January, 1847, ten sovs.—Lord Talbot de Malahide, the Castle, Malahide; Devon bull Young Richard, calved the 27th of January, 1849, bred by Thomas Gifford, Esq., Northtown Farm, Cadbury, got by Gallant, dam Fillpail, g.d. Old Fillpail.

For the best polled Angus or Galloway bull, calved on or after the 1st of January, 1847, ten sovs.—Lord Talbot de Malahide, the Castle, Malahide; polled Angus bull Charlie, calved the 3rd of January, 1849, bred by William Fullerton, Esq., Scotland, got by Earl of Buchan, dam Black Bess, g.d. Rose, by Earl Spencer.

For the best Hereford cow in calf, or that had a calf in 1852, five sovs.—Richard W. Reynell, Killynou, Killucan; Hereford cow Red Rose, calved May, 1848, bred by exhibitor, got by Goldfinder, dam by Emperor, g.d. English John.

For the best Devon cow in calf, or that had a calf in 1852, five sovs.—The Earl of Charlemont, Marino, Clontarf; Devon cow Primrose, calved the 4th of May, 1849, bred by exhibitor, got by Old Shamrock, out of Polly, g.s. Kingsland, g.d. Cherry.

For the best polled Angus or Galloway cow in calf, or that had a calf in 1852, five sovs.—Lord Talbot de Malahide, the Castle, Malahide; polled Angus cow Jeannie Deans, calved April, 1848, bred by Robert Adamson, Esq., Middledrums, N. B., got by Black Prince, dam a pure Angus cow, a winner of several prizes.

For the best Devon heifer, in calf or in milk, calved on or after the 1st of January, 1849, five sovs.—the earl of Charlemont, Marino, Clontarf, Devon heifer, Rose, calved 7th June, 1850, bred by exhibitor, got by Young Shamrock, out of Handsome, g.s. Old Shamrock, g.d. Ruby.

For the best polled Angus or Galloway heifer, in calf or in milk, calved on or after 1st of January, 1849, five sovs.—Lord Talbot de Malahide, the Castle, Malahide, a polled Angus heifer, Violet, calved 1st March, 1850, bred by Robert Adamson, Esq., of Middledrums, N. B.

For the best Devon heifer, calved on or after the 1st January, 1851, three sovs.—the Earl of Charlemont, Marino, Clontarf, a Devon heifer, Cherry, calved 1st November, 1851, bred by exhibitor, got by Young Shamrock, out of Handsome, g.s. Old Shamrock, g.d. Ruby.

For the best polled Angus or Galloway heifer, calved on or after the 1st January, 1851, three sovs.—Adam Grierson, Cashel, a Galloway heifer, calved 2nd March, 1851, bred by James Graham, Esq., Meikle, Scotland, got by Terry, who gained the first prize, as a two year old, at Glasgow, in 1850.

SMALL AND MOUNTAIN BREEDS.

For the best Ayrshire bull, calved on or after 1st January, 1847, five sovs.—John Hamilton, Edelwood, by Hamilton, Scotland, an Ayrshire bull, London Gondy, bred by Mr. Stivhie, county of Ayr, got by the celebrated bull Avondale, dam Daisy.

For the best West Highland bull, calved on or after 1st January, 1847, five sovs.—P. S. Comyn, Woodstock, Galway, a pure bred West Highland bull Donald, calved May, 1847, bred by Colonel La Touche, Luggelaw, Roundwood. William Owen, Blessington, a pure-bred west Highland bull, Young Donald, calved June, 1849, bred by exhibitor, got by Donald (Donald by Colonel La Touche's bull), highly commended.

For the best Kerry bull, calved on or after 1st Jan., 1847, 5 sovs.—Samuel Garnet, Arch Hall, Navan, a Kerry bull, Pablo Fanque, 4 years old, bred in the county Kerry.

For the best Ayrshire cow, in calf or in milk, or that had a calf in 1852, four sovs.—Tiernan and Lockhart, Middle Abbey-street, Dublin, an Ayrshire cow.

For the best West Highland cow, in calf or in milk, or that had a calf in 1852, four sovs.—James Hamilton, St. Ernan's, Donegal, a West Highland cow, Duchess, calved in 1844, bred by the Duke of Sutherland; obtained Highland Society's prize in 1848. William Owen, Blesinton, a pure West Highland cow, Maggie, calved May, 1846, bred by Colonel La Touche, Luggelaw, county Wicklow, highly commended.

For the best Kerry cow, in calf or in milk, or that had a calf in 1852, four sovs.—Alexander C. Lambert, Cong Abbey, Cong, a Kerry dexter cow, Cricket, 7 years old.

For the best Ayrshire heifer, in calf or in milk, calved on or after 1st January, 1849, three sovs.—Tiernan and Lockhart, Middle Abbey-street, Dublin, an Ayrshire heifer.

For the best West Highland heifer, in calf or in milk, calved on or after 1st January, 1849, three sovs.—P. J. Comyn, The Farm, Galway, a West Highland heifer, Colleen, in calf, 2 years old, bred by exhibitor, got by Young Donald.

For the best Kerry heifer, in calf or in milk, calved on or after 1st January, 1849, three sovs.—Pierce Joyce, Ardfry, Oranmore, a Kerry heifer, in milk, Glengariff, calved in 1849.

For the best lot of two West Highland heifers, calved on or after 1st January, 1851, two sovs.—Sir Thomas Burke, Bart., M.P., Marble Hill, Loughrea, a lot of two West Highland heifers, bred by exhibitor.

For the best of all the prize bulls exhibited at the Show, the gold medal—Thomas Crisp, Hawkhill, Northumberland, for short-horned bull, Phœnix.

To the breeder of the best prize bull, the medal—Thomas Crisp, Hawk-hill, Northumberland.

For the best of all the prize cows or heifers exhibited at the show, the gold medal—Charles Towneley, Towneley Park, Burnley, for short-horned heifer, Butterfly.

To the breeder of the best prize cow or heifer, the medal—Charles Towneley, Towneley Park, Burnley.

The Agricultural Challenge Cup, value one hundred sovs., given by the late Peter Purcell, Esq., for the best animal in the neat cattle classes, possessing most merits, of its kind, in the estimation of the judges. Charles Towneley, Towneley Park, Burnley, for short-horned heifer, Butterfly.

HORSES.

For the best cart stallion over three years old, and foaled on or after the 1st Jan., 1845, 30 sovs.—John Woolsey, Milesdown, Castlebellingham; a Clydesdale cart stallion, No Mistake, foaled 27th May, 1847, bred by exhibitor, got by Young Sir Harry, out of a Normandy mare.

For the second best ditto, 10 sovs.—Alexander Binney, Collingstown, Santry, Dublin; a Clydesdale cart stallion, Lively, foaled 28th May, 1847; bred by Mr. Thomas Mickle, Scotland, got by Mr. Bullock's Clyde, out of a first-class Clydesdale mare, gs. Champion, dam by Sampson, gd. by Old Britain; Adam Grierson, Cashel, Clydesdale cart stallion, commended.

For the best cart stallion, foaled on or after the 1st Jan., 1849, 15 sovs.—Sylvester Rait, Rathmoyle, Edenderry; a Clydesdale cart stallion, Glancer, foaled 27th June, 1849; bred by Mr. Alexander Broxburn, Mid-Lothian; got by John Anderson, gs. Byron, ggs. Clydesdale Jock, out of a pure-bred Clydesdale mare.

For the second best ditto, five sovs.—James Young, Carputhall, Linlithgowshire, Scotland; a cart stallion, Young Blythe, two years old, got by Johnny Cope, the property of J. Alexander, Esq., Broxburn Hall; gs. Young Clydesdale Jock, the property of Samuel Clark, Glasgow.

For the best thorough-bred stallion, the medal—Wills C. Gason, Richmond, Nenagh; a thorough bred stallion, The Reiver, foaled March, 1844, bred by Lieutenant-Colonel Westenra, Sharavogue, Roscrea; got by Frenzy, dam Kiss, by Waxy Pope, gd. Sister to Norfolk, by Champion. Frenzy got by Roller, by Lucy.

For the best cart mare in foal or with a foal at her foot, or having reared a foal in the year 1851, ten sovs.—Sylvester Rait, Rathmoyle, Edenderry, a Clydesdale cart brood mare Bett, with a foal at foot, 10 years old, by exhibitor.

For the second best ditto, five sovs.—John Woolsey, Milesdown, Castlebellingham; a cart mare Nelly, with foal at foot, foaled in May, 1844, bred by exhibitor, got by an imported Clydesdale stallion Ploughboy, out of a Rob Roy mare.

For the best cart filly, not exceeding three years old, five sovs.—Sylvester Rait, Rathmoyle, Edenderry; a Clydesdale cart filly, Gentle, foaled June, 1849, bred by exhibitor, got by Lanark, out of Clyde.

SHEEP.

LEICESTERS.

For the best shearling ram, 15 sovs.—Frederick Founes Hamilton, Windmill Farm, Edenderry; a shearling Leicester ram, bred by William Sandy, Esq., Holme-pierrepoint, Nottingham.

For the second best ditto, five sovs.—T. Carter, Scales, Richmond, Yorkshire; a shearling ram.

Thos. Roberts, Strokestown, ram, highly commended.

For the best two-shear ram, ten sovs.—T. Carter, as above.

For the second best, 5 sovs.—George Spencer, Normanton House, Hinckley, Leicestershire; a pure two-shear Leicester ram.

George Spencer, Normanton House, commended.

For the best ram of any age, five sovs.—Thomas Skilling, professor of agriculture, Queen's College, Galway; a four-shear Leicester ram.

For the best pen of five shearling ewes, ten sovs.—Thomas Carter, Scales, Richmond, Yorkshire; a pen of five shearling Leicester ewes.

For the second best, 5 sovs.—Thomas Carter, Scales, Richmond, Yorkshire.

For the best pen of five ewe lambs, 5 sovs. — John La Touche, Harristown, Brannoxton; a pen of five Leicester ewe lambs.

OTHER LONG-WOOLLED SHEEP NOT QUALIFIED TO COMPETE AS LEICESTERS.

For the best shearling ram, ten sovs.—David Kerr, Clonin, Edenderry; a shearling long-woolled ram.

For the second best, 5 sovs.—Fred. F. Hamilton, Windmill Farm, Edenderry.

For the best two-shear ram, eight sovs.—Sylvester Rait, Rathmoyle, Edenderry; a two-shear long-woolled ram.

For the second best, four sovs.—Sylvester Rait, Rathmoyle, Edenderry; a two-shear long-woolled ram.

For the best ram of any other age, five sovs.—George Thunder, Kingston Lodge, Navan; an aged long-woolled ram.

For the best pen of shearling ewes, five sovs.—Sylvester Rait, Rathmoyle, Edenderry; a pen of five long-woolled shearling ewes.

For the second best, three sovs.—Samuel Garnett, Archhall, Navan; a pen of five shearling long-woolled ewes.

For the best pen of five ewe lambs, three sovs.—Samuel Garnett, Arch-hall, Navan; a pen of five long-woolled ewe lambs.

SOUTHDOWNS.

For the best shearling ram, 8 sovs.—Tiernan and Lockhart, Middle Abbey-street, Dublin, a shearling Southdown ram.

For the best ram of any other age, 4 sovs.—William Owen, Blesinton, a pure two-shear Southdown ram.

For the best pen of five shearling ewes, 3 sovs.—John Woolsey, Milesdown, Castlebellingham, a pen of five Southdown shearling ewes.

CHEVIOTS.

For the best shearling ram, 8 sovs.—Marquis of Conyngham, Castle Slane, Slane, a shearling pure Cheviot ram.

For the best ram of any other age, 4 sovs.—Marquis of Conyngham, Castle Slane, Slane, a pure three shear Cheviot ram.

For the best pen of five shearling ewes, 3 sovs.—Marquis of Conyngham, Castle Slane, a pen of five pure Cheviot shearling ewes.

BLACK-FACED OR OTHER MOUNTAIN SHEEP.

For the best shearling ram, 5 sovs. —no entry.

For the best ram of any other age, 3 sovs.—John J. Lopdell, Raheen, Athenry, a black-faced ram.

For the best pen of five shearling ewes, 2 sovs.—crosses only exhibited, and no premium awarded.

For the best ram in the above classes, the medal—Fred. F. Hamilton, Windmill Farm, Edenderry.

To the breeder of the best ram in the above classes, the medal—Wm. Sandy, Holme Pierrepoint, Nottingham.

SWINE.

For the best boar under 18 months old, 10 sovs.—Arthur E. Chaigneau, Benown, Ballymahon, a Berkshire boar, Friar Bacon, pigged 25th June, 1851, bred by Captain Croker, got by Sir Roger Bacon.

For the second best ditto, 5 sovs.—Rev. J. Warburton, Kill, county Kildare, a pure bred Berkshire boar, pigged 29th Sept., 1851.

For the best boar over 18 months old, and under 36 months old, 8 sovs.—Thomas Skilling, Professor of Agriculture, Queen's College, Galway. For the second best ditto, 4 sovs.—Alexander Montgomery, Kilmer House, Ballivor, Athboy; a Berkshire boar, pigged 29th October, 1849.

For the best breeding sow, under 18 months old, 8 sovs.—Joseph Spence, Himpley, Leicestershire. For the second best ditto, 4 sovs.—Edward Croker, Ballytore House, Ballytore; a Berkshire sow, under 18 months old.—Rev. John Warburton, Kill, county Kildare; a pure-bred Berkshire sow in pig, 13 months old, highly commended.

For the best breeding sow, over 18 months old, 5 sovs.—Rev. John Warburton, Kill, county Kildare; a pure-bred Berkshire sow, accompanied by litter, two years and nine months old.

For second best ditto, 3 sovs.—Augustus Warburton, Kill, county Kildare; a pure-bred Berkshire sow, accompanied by litter, pigged 1st April, 1850. Thomas Ball, Robert's Walls, Malahide; an improved Berkshire sow and litter, pigged 14th October, 1850, commended.

For the best lot of three breeding pigs, of the same litter, not more than 10 months old, 5 sovs.—Viscount Monck, Charleville, Enniskerry; a lot of three pure-bred black and white Berkshire sows, pigged October 30, 1851, bred by exhibitor, got by a full brother to the sows, which won the first prize as three best breeding pigs, under ten months old, at the Royal Dublin Society, April, 1850, dam full sister to the three sows which won the same prize April, 1851, and two of which won first and second prizes as the best breeding sows under 18 months old at the Royal Agricultural Improvement Society's show, August, 1851.

For second best ditto, 3 sovs.—Augustus Warburton, Kill, county Kildare.

POULTRY.

Fowl.—For the best Dorking cock and hen, £1 10s.—Mrs. Warburton, Kill, county Kildare, a Dorking cock and two hens.

For the best couple of Spanish pullets, 10s.—Mrs. Teresa Carton, 16, Halston-street, Dublin, a couple of Spanish pullets.

For the best Polish cock and hen, £1 10s.—Arthur J. C. Skilling, Prospect, Oranmore, a Polish cock and hen.

For the best couple of Polish pullets, 10s.—Arthur J. C. Skilling, Prospect, Oranmore, a couple of Polish pullets.

For the best Malay cock and hen, £1 10s.—Mrs. Teresa Carton, 16, Halston-street, Dublin, a Malay cock and hen.

For the best couple of Malay pullets, 10s.—Mrs. Teresa Carton, 16, Halston-street, Dublin, a couple of Malay pullets.

For the best couple of Turkey poults, 10s.—Mrs. P. Kennedy, Doon, Abascragh, a couple of Turkey poults.

Geese.—For the best couple of geese, £1 10s.—John Latouche, Harristown, Brannoxton, a couple of geese.

For the second best ditto, 10s.—Mrs. Teresa Carton, Halston-street, Dublin.

Ducks.—For the best Aylesbury drake and two ducks, £1 10s.—Arthur J. C. Skilling, Prospect, Oranmore, an Aylesbury drake and two ducks.

For the second best ditto, 10s.—Mrs. Warburton, Kill, county Kildare, an Aylesbury drake and two ducks.

For the best drake and two ducks of any other breed, £1

10s.—Mrs. Teresa Cartou, 16, Halston-street, Dublin, a Rouen drake and two ducks.

For the second best ditto, 10s.—Mr. Thomas Bunbury, Spiddal House, Galway.

DAIRY PRODUCE.

To the owners of dairies who shall make and produce the best quality of butter for the London and foreign markets, made on their own farms during the season of 1852, not being less than one firkin of 70lbs. weight, on the following terms :

For the English or London market, first prize, five sovs.—William Dargan, Moate.

Second prize, three sovs.—William Dargan, Moyvaghly, Moate ; a firkin of butter.

Third prize, two sovs.—John Mealey, Aidstown, Rathmore, Co. Kildare ; a firkin of butter.

For the foreign market, first prize, five sovs., and second prize, three sovs.—William Dargan, Moyvaghly, Moate ; a firkin of butter.

Third prize, two sovs.—Pierce Creagh, Clare.

CHEESE.

For the best couple of new-milk cheeses, made in Ireland, of the season of 1852, in imitation of any known and approved description of English cheese, not less than 20lbs. each, first prize, five sovs.—Colonel Henry Dwyer, Ballyquick Castle, Borrisokane ; a couple of new-milk cheeses.

DAIRY PRODUCE.

To the owners of dairies, who shall make and produce the best quality of butter for the London and foreign markets, made on their own farms during the season of 1852, not being less than one firkin of 70lbs. weight, on the following terms :

For the English or London market—First prize, five sovs.—Mrs. Dargan, Moate.

Second prize, two sovs.—John Sills, Jones's Lake House, Moate, a couple of new-milk cheeses, in imitation of Gloucester. Thomas Eeles, Dublin, recommended.

FLAX.

For the best bundle, not less than 16lbs. weight, of mill-scutched flax, being an average sample of the produce of at least half an acre—First prize, three sovs., and second prize, two sovs.—Edward Smyth, Deramore, Newry, a bundle of white mill-scutched flax.

For the best bundle, not less than 16lbs. weight, of half-scutched flax, ditto—First prize, three sovs.—Edward Smyth, Deramore, Newry, a bundle of hand-scutched flax, a sample of three acres.

Second prize, two sovs.—Denis Kirwan, Castlehacket, Tuam, a bundle of hand-scutched flax.

For the best half-bushel of flaxseed saved by the grower, first class medal.—Denis Kirwan, Castlehacket, Tuam, half a bushel of flaxseed.

For second best, second class-medal—Francis Pratt, Corrinseca, Kingscourt, half a bushel of flaxseed.

AGRICULTURAL IMPLEMENTS.

The following are the prizes awarded in this department :—

For the best plough for performing the ordinary work of the farm. First class medal—James Kirkwood, Tranent foundry, Tranent.

For the best plough for deep trench ploughing, capable of being worked by not more than four horses. First class medal —Robert Gray, Police-place, Belfast.

For the best instrument for breaking up the subsoil, capable of being worked by not more than four horses.

First class medal—Robert Gray, Police-place, Belfast.

For the best grubber or cultivator, to be worked by two or more horses. First class medal—Thomas Eeles and Co., Mary-street, Dublin.

For the best grubber for green crops. First class medal—Robert Gray, Police-place, Belfast.

For the best constructed seed harrow. First class medal—Thomas Eeles and Co., Mary-street, Dublin.

For the best break harrow, or other instrument for pulverising the soil. First class medal—Robert Gray, Police-place, Belfast.

For the best roller or clod-crusher. First-class medal—Joshua Edmundson and Co., Capel-street, Dublin.

For the best horse rake. First-class medal—Barrett, Exall, and Andrews, Halea Grove Works, Reading.

For the best farm cart. First class medal—W. and J. Ritchie, Ardee.

For the best drill for sowing turnip seed in one or two drills. Second class medal—Thomas Eeles and Co., Mary-street, Dublin.

For the best drill for sowing turnip seed, &c., with apparatus for distributing eight portable manures. The gold medal—James Smith and Son, Peasenhall, Suffolk.

For the best machine for distributing liquid manure. First-class medal—William Croskill, Beverley.

For the best machine for drilling grain. The gold medal—James Smith and Son, Peasenhall.

For the best machine for cleaning grain. First-class medal —W. and J. Ritchie, Ardee.

For the best machine for cutting turnips. First-class medal —Richmond and Co., Salford.

For the best chaff-cutting machine. First-class medal—Richmond and Co., Salford.

For the best machine for crushing oats, beans, or other grain. First-class medal—Barrett, Exall, and Co., Katesgrove Works, Reading.

For the best apparatus for steaming food for cattle. First-class medal—Mr. P. Stanley, Peterborough.

For the best and most economical root washer. Second class medal—William Crosskill, Beverley.

For the best thrashing machine suitable for large farms, worked by either horse or steam power. The Council gold medal—Barrett, Exall, and Co., Katesgrove Works, Reading.

For the best thrashing machine suitable for small farmers. First class medal—Barrett, Exall, and Company, Reading.

For the best churn worked by hand. First class medal—Eels and Co., Mary-street, Dublin.

For the best set of smaller utensils for the dairy, such as milk-cools, &c. Second class medal, Simeon R. Fraser, Mary-street, Dublin.

For the best set of horses' power gearing, economically adapted to fit machines, churns, &c. First class medal, Barrett, Exall, and Co., Reading.

For the best class of draining tiles. Second class medal, J. Ingram, Rathfarnham.

For the best assortment of hand implements used for the farm, such as draining tools, spades, scythes, &c. First class medal, Joshua Edmundson and Co., Capel-street, Dublin.

For the best and most economical set of farm harness. First-class medal—Thomas Stokes, Eyre-square, Galway.

For the best swing-trees or draught-bars. Second-class medal.—Robert Gray, Police-place, Belfast.

For the best and most economical iron field-rakes, on correct principles. First-class medal—Edmund Hill and Co., Brierly, Staffordshire.

For the best and most economical description of portable shedding for affording shelter to cattle and sheep on pasture. First-class medal—Thomas Ritchie and Sons, Belfast.

For the best assortment of hurdles or other moveable fence suited for folding sheep on turnips, &c. First-class medal—Edward Hill and Co., Brierly.

FLAX.

For the best flax-breaking machine. First-class medal—Messrs. A. and W. Smith, Paisley.

For the best scutching mill. First-class medal—Messrs. Smith, Paisley.

THE REAPING MACHINE.

In a report made by the judges of farming implements to the council, amongst other matters the following occurs :—

" Hussey's reaping machine. improved by Crosskill, highly recommended and awarded a first-class medal. Here the object of cutting a clean and upstanding field of corn cleanly, and laying it in better order for binding than is usually done by the hook, seems to have been attained. The machine fails in cutting corn that has been laid, and is liable to obstruction from choking when there is a considerable undergrowth of clover or seeds. It will not cut grass, but it is adapted to cut beans or any other stiff crop. We have hopes that the enterprising introducer of the instrument will be able to overcome those difficulties and effect much improvement in its general applicability."

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The institution is in its 68th year, and has far outgrown its original intention. From being a local association of very humble pretensions, it has become a national organization of the most influential character, and though now distanced by its younger competitor, the Royal Agricultural Society of England, and closely followed by the Royal Agricultural Improvement Society of Ireland, its meetings are still looked forward to with interest, and its premiums enlist the competition of agriculturists from every part of the empire.

The show for this year was looked forward to with some anxiety. So much having been said of late about the depressed state of agriculture, fears were entertained in some quarters that the exhibition would prove a failure; but instead of this, the entries, both of implements and stock, have been larger than on any former occasion, and the proceedings thus far have been of the most encouraging description.

The ground appropriated for the showyard is a spacious common on the south side of the city, surrounded by parallel rows of fine old elms, and flanked on the east by the embankment of the river. Here about 10 acres of the greensward are enclosed, and the space is appropriated in a manner which affords ample accommodation for the various departments of the exhibition. A large portion of the yard is occupied with upwards of 300 implements of husbandry—a part is given to the produce of the dairy, and the remainder is disposed in open stalls, well filled with every variety of cattle; but the show of roots and seeds, which forms an important part of the Royal Exhibition of Agriculture in England, do not appear to be considered worthy of much attention on this side of the Tweed.

The exhibition of implements on Wednesday, August 4, presented no feature of marked interest. It consisted chiefly of well-known and often described machines, mostly of English invention—the Scotch clinging with characteristic tenacity to their own plough and harrow, and depending more on manual labour than the agencies of either wind or steam. There was no steam plough exhibited, although one had been expected, and disappointment was expressed that Hussey's reaping machine, which gained the first prize at the great show in England, was not on the ground. Five other reaping machines, however, were exhibited, one of which, invented by Mr. Patrick Bell, of Forfarshire, some twelve years ago, and presenting features precisely similar to the American machines, attracted much attention. To-morrow these machines are to be tried on a neighbouring farm, and a very spirited contest is likely to take place.

The great interest of the exhibition was centred in the proceedings of the day. At an early hour there was a large influx of strangers, and by noon the trains poured into the "fair city" thousands of visitors from all parts of Scotland. The weather being highly propitious, the show ground presented a fine sight, it being calculated that there could not be fewer than from 10,000 to 15,000 persons in and around it soon after the doors of the yard were thown open. The charge for admission was 2s. 6d. from 10 to 12 o'clock, and 1s. from 12 to 4. In 1836, when the society held its last show here, £250 was taken at the doors at these prices, but to-day no less than £780 was received for visitors' tickets, notwithstanding the members of the society and exhibitors of stock and implements were this year admitted free. It is estimated that 7,000 persons were within the show-yard, among whom were many of the leading nobility and gentry of Scotland. Notwithstanding the large number of visitors, so perfect were the arrangements that not the slightest confusion occurred, nor did a single accident happen during the day.

The entries of stock comprised 313 cattle, 135 horses, 662 sheep, and 50 swine. The polled breeds were the most numerous. In this department the counties of Angus, Aberdeen, and Galloway presented a remarkable display of fine animals. The first prize for the best bull was gained by Mr. Watson, of Keilor, and the first for the best cow by Mr. M'Combie, of Tillyfour, Aberdeen. The shorthorns showed well, Mr. Chrisp, of Hawkhill, Alnwick, carrying off the first prize for the best bull of any age; the prize for the best bull calved after the 1st of January, 1850, being awarded to Mr. A. Cruickshank, of Sittytar, near Aberdeen. A gold medal was given to Mr. M'Combie for the best pair of oxen calved after the 1st of January, 1849. These oxen were looked upon with much interest, as showing how prime animals can now be raised in three years so as to command the first prices in the London market; and it was remarked, in reference to this stock, that from Aberdeenshire alone last year 30,000 head of such cattle were exported, yielding a return of above £500,000. To enable the cattle breeders of the county to raise this quantity of stock, it was stated that 10,000 tons of guano were last year put upon the land, and that the crops of grass and turnips raised had been far beyond anything that used to be got from the best of home manure some ten years since. Ayrshire produced some fine specimens of dairy stock, and the West Highlands had also a moiety worthy of notice. The Marquis of Breadalbane showed some remarkable animals of the pure native black, and the Lord Justice-General, who is a Highland proprietor, carried off the first prize for the best Highland bull. But the small tenantry in the Highlands made no appearance. There were five premiums offered for the best stock of "tenants paying rents not exceeding £100 per annum," but there were no entries—a fact which indicates very clearly the present reduced state of the small Highland farmer. The entries of "horses for agricultural purposes" were not numerous, but the prize animals were considered to be an improvement on those previously shown.

The most remarkable feature in the appearance of all the cattle exhibited were their fine symmetry and comfortable condition. Formerly the great desideratum was fat; now the chief concern of the breeder seems to be to have no more fat than is required by the laws of nature; and in this respect the Scotch appear to have gone a-head of the English breeders. In the show to-day there were very few unwieldy animals, and one of the judges, in pronouncing upon the merits, in remarking upon this characteristic, said it might be taken as a proof that they had now given up ornament for use.

The department of sheep was well supported. The Leicester tup came out strong, and Northumberland carried off the chief prizes. The Cheviots were in abundance, and the Highland breeds were well represented. In swine there was but a poor show, the Scotch having evidently no great favour for pork. Two of the prizes in this department went to Cumberland.

LIST OF PRIZES AWARDED.

SHORTHORNS.

SWEEPSTAKES for BULLS, to Thomas Chrisp, Hawkhill, Alnwick.

Bulls of any age, 20*l.* and the silver medal, Thomas Crisp, Hawkhill, Alnwick.

Bulls calved after 1st Jan., 1850, 10*l.*, A. Cruickshank, Sittyton, Aberdeen.

Bulls calved after 1st Jan., 1851, 6*l.*, Duke of Buccleuch, Dalkeith Park.

Cows of any age—1st prize, 10*l.*, James Douglas, Athelstaneford, Haddington; 2nd, 5*l.*, William Tod, Elphinstone Tower, Tranent.

Heifers calved after 1st Jan, 1850 - 1st prize, 8*l.*, James Douglas, Athelstaneford, Haddington; 2nd, 4*l.*, James Cunningham Grant Duff, of Eden, Banff.

Heifers calved after 1st Jan., 1851, 5*l*, James Douglas, Athelstaneford, Haddington.

POLLED BREEDS.—ABERDEEN, ANGUS, AND GALLOWAY.

SWEEPSTAKES for POLLED BULLS, to Hugh Watson, Keillor, Cupar Angus.

Bulls of any age, 15*l.* and the silver medal, Hugh Watson, Keillor.

Bulls calved after 1st Jan., 1850, 8*l.*, Alexander Bowie, Mains of Kelly, Arbroath.

Bulls calved after 1st Jan., 1851, 5*l.*, Thomas Carnegy, of Craigo, Montrose.

Cows of any age—1st prize, 8*l.*, William M'Combie, Tillyfour; 2nd, 4*l.*, Hugh Watson, Keillor.

Heifers calved after 1st Jan., 1850—1st prize, 6*l.*, and 2nd, 3*l.*, William M'Combie, Tillyfour.

Heifers calved after the 1st Jan., 1851, 4*l.*, Robert Scott, Balwyllo, Angus.

Pair of oxen calved after 1st Jan., 1849, the medium gold medal, William M'Combie, Tillyfour.

AYRSHIRE BREED.

SWEEPSTAKES for AYRSHIRE BULLS, to A. W. Buttery, Monkland, Airdrie.

Bulls of any age, 15*l.* and the silver medal, A. W. Buttery, Monkland, Airdrie.

Bulls calved after 1st Jan., 1850, 8*l.*, A. W. Buttery, Monkland, Airdrie.

Cows of any age in milk—1st prize, 8*l.*, A. W. Buttery, Monkland, Airdrie; 2nd, 4*l.*, James Young, Haudaxwood, Whitburn, Midlothian.

Cows of any age in calf—1st prize, 6*l.*, Alex. M'Lachlan, East Longhaugh, Bishopton, Renfrewshire; 2nd, 3*l.*, Robt. Kirkwood, High Longmuir.

Heifers calved after 1st Jan., 1850—1st prize, 6*l.*, John Paterson, Macorriston; 2nd, 3*l.*, William Muir, Hardington Mains, Biggar.

Heifers calved after 1st Jan., 1851, 4*l.*, John Hamilton, Burnbrea, Avondale, Lanarkshire.

HIGHLAND BREED.

Bulls of any age, 15*l.* and the silver medal, the Right Hon. Duncan M'Neill, of Colonsay, Lord Justice-General.

Bulls calved after 1st Jan., 1850, 8*l.*, John M'Donald, Inverlochlang, Lochearnhead, Perthshire.

Cows of any age—1st prize, 8*l.*, the Marquis of Breadalbane, Taymouth Castle; 2nd, 4*l.*, Neill Malcolm, of Poltalloch, Lochgilphead.

Heifers calved after 1st January, 1849—1st prize, 6*l.*, to the Marquis of Breadalbane; 2nd prize, 3*l.*, to Robert Peter, Urlar, Aberfeldy.

Heifers calved after 1st January, 1850, 4*l.*, Donald McLaren, Braeleny, Callander.

Pair of Oxen calved after 1st January, 1848; the Medium Gold Medal; Alexander Campbell, of Monzie, Crieff.

FIFESHIRE BREEDS.

SWEEPSTAKES FOR FIFESHIRE BULLS, to Robert Wilson, Firthfield, Anstruther.

Bulls of any age, 10*l.* and Silver Medal, John Rintoul, Ovenston, Pittenweem.

Cows of any age, 6*l.*, William Fullarton, Mains of Ardestie, Dundee.

Heifers calved after 1st January, 1850, 4*l.*, David Wallace, Balgrummo.

HORSES FOR AGRICULTURAL PURPOSES.

Stallions—1st prize, 25*l.* and the Silver Medal, Samuel Clark, Manswrae, Kilbarchan, Renfrewshire; 2nd prize, 10*l.*, John Smith, Grassmarket, Edinburgh.

Entire Colts foaled after 1st January, 1849, 10*l.*, Alexander Lawson, Old Mills, Elgin.

Entire Colts foaled after 1st January, 1850, 8*l.*, James Kay, Hillfarm, Gargunnock, Stirlingshire.

Entire Colts foaled after 1st January, 1851, 6*l.*, John and Peter Young, Niddry, Winchburgh, West Lothian.

Mares—1st prize, 10*l.*, A. W. Buttery, Monkland, Airdrie; 2nd prize, 5*l.*, Andrew Logan, Crosflit, Kilbarchan, Renfrewshire.

Fillies foaled after 1st January, 1849, 8*l.*, Robert Murdoch, Hallside, Cambuslang, Lanarkshire.

Fillies foaled after 1st January 1850, 6*l.*, Andrew Logan, Crossflit, Kilbarchan, Renfrewshire.

Fillies foaled after 1st January, 1851, 4*l*, Robert Jack, Balcarroch, Campsie, Stirlingshire.

EXTRA SECTIONS.

Highland Pony Stallions, not over 14, nor under 12 hands, 8*l*, Alexander Campbell of Monzie, Crieff.

Highland Pony Mares, same height, 5*l.*, Sir John Stuart Forbes, of Pitsligo, bart., Laurencekirk.

SHEEP—LEICESTER BREEDS.

Tups not exceeding 4 years old—1st prize, 8*l*, John Davison, Brandon, Whitehouse, Wittingham, Northumberland; 2nd prize, 4*l.*, Thomas Dickinson, Maiden Hall, St. Boswells.

Pair of Dinmont or Shearling Tups—1st prize, 8*l.*, John Davison, Brandon Whitehouse; 2nd prize, 4*l.*, James Douglas, Athelstaneford, Haddington.

Pen of five Ewes not exceeding five years old—1st prize, 6*l.*, Adam Thomson, Rutherford, Kelso; 2nd prize, 3*l.*, William Tod, Elphinstone Tower, Tranent.

Pen of five Shearling Ewes or Gimmers, 4*l.*, James Douglas, Athelstaneford, Haddington.

CHEVIOT BREED.

Tups not exceeding four years old—1st prize, £8, James Brydon, Moodlaw; 2nd prize, £4, Walter Carruthers, Kirkhill, Moffatt.

Pair of Dinmont or shearling tups—£8, & £4; 1st and 2nd prizes, Thomas Elliot, Hindhope, Jedburgh.

Pen of five ewes not exceeding five years old—1st prize, £6, Thomas Elliot, Hindhope, Jedburgh; 2nd prize, £3, James Brydon, Moodlaw, Langholm.

Pen of five gimmers, lambed after 1st April, 1851—£4, Adam Elliot, Goldielands, Hawick.

BLACKFACED BREED.

Tups not exceeding four years old—1st prize, £8, Robert Paterson, of Birthwood, Biggar; 2nd prize, £4, Adam Blacklock, Minnygap. Moffat.

Pair of Dinmont or shearling tups—1st prize, £8, James Tweedie, Nether Abington; 2nd prize, £4, John and James Watson, Mitchelhill, Biggar.

Pen of five ewes not exceeding five years old—1st prize,

£6, James Brydon, Kennelhead, Moffat; 2nd prize, £3, Donald M'Laren, Braeleny, Callander.

Pen of five gimmers, lambed after 1st April, 1851—£4, Patrick Small, of Dirnanean, Kirkmichael, Perthshire.

SOUTHDOWN BREED.

Tups not exceeding four years old—1st prize, £8, James Atchison, of Alderston, Haddington; 2nd prize, £4, Hugh Watson, Keillor.

Pair of shearling tups—1st prize, £8, Hugh Watson, Keillor; 2nd prize, £4, James Atchison, of Alderston.

Pen of five ewes not exceeding five years old—1st prize, £6, Hugh Watson, Keillor; 2nd prize, £3, William Tod, Elphinstone Tower, Tranent.

Pen of five shearling ewes or gimmers—£4, Hugh Watson, Keillor.

SWINE.

Boars, large breed—1st prize, £5, W. H. Brown, of Ashley, Ratho, Mid-Lothian; 2nd prize, £3, John Gordon, of Aikenhead, Glasgow.

Boars, small breed—1st prize, £5, Jonathan Brown, the Height, Wigton, Cumberland; 2nd prize, £3, Robert Harrison Watson, Bolton Park, Wigton, Cumberland.

Sows, large breed—£4, George Hay Plummer, Melville, Dalkeith.

Sows, small breed—1st prize, £4, John Arklay, Powmill, Brechin; 2nd prize, £2, A. W. Buttery, Monkland, Airdrie.

Pen of three pigs not exceeding eight months old—1st prize, £4, Jonathan Brown, the Height, Wigton, Cumberland; 2nd prize, £2, the Earl of Mansfield, Scone Palace, Scone.

POULTRY.

Turkeys, Norfolk or black breed—£1, James Wilson, Woodburn, Dalkeith.

Turkeys of any other breed—£1, the Marquis of Breadalbane, Taymouth Castle.

Fowls, mottled or speckled Dorking breed—£1, Robert E. C. Benton, Glasgow.

Fowls, Spanish breed—£1, Robert E. C. Benton, Glasgow.

Fowls, gold or silver spangled Hamburg breed—£1, Robert E. C. Benton, Glasgow.

Fowls, Malay breed—£1, Robert E. C. Benton, Glasgow.

Fowls, Cochin-China breed—£1, Robert E. C. Benton, Glasgow.

Ducks, Aylesbury breed—£1, the Marquis of Breadalbane, Taymouth Castle.

Ducks of any other breed—£1, Sir Thomas Moncreiffe, of Moncrieffe, Bart.

Geese—£1, William Muir, Hardington Mains, Biggar.

DAIRY PRODUCE.

For the best sample (not less than 14lb.) of butter, cured in 1852, £3. Adam Roy, Broadlees, Dunblane.

For the second best, £2. James Gibson, Pitlochrie, Perthshire.

For the best sample (not less than 14lb.) of powdered butter, £3. James Patrick M'Inroy, of Lude, Blair Athole.

For the second best, £2. Mrs. William Sutherland, Dalmore, Alness.

For the best sample of fresh butter, three rolls of ½lb. weight each, £3. Lady Louisa Moncreiffe, of Moncreiffe, Perth.

For the second best, £2. Sir John Stuart Forbes, of Pitsligo and Fettercairn, Bart.

For the best couple of cheeses made from sweet milk, in 1852, £3. James Allan, Westmains, Stonehouse, Lanarkshire.

For the second best, £2. John Dunlop, Whiteshaw Gate, Strathaven, Lanarkshire.

For the best couple of cheeses made from skimmed milk, in 1852, £3. Mrs. Buchanan, Gilchorn, Arbroath.

For the second best, £2. Thomas Muir, Bowhouse, Lanark.

For the best imitation of any known description of English cheese, £3. M. S. M'Inroy, Lude, Blair Athole.

For the second best, £2. James Allan, Westmains, Stonehouse, Lanarkshire.

IMPLEMENTS AND MACHINES.

For the best two-horse plough for general purposes, £2. George Ponton, Grougfoot, Linlithgow.

For the best double mould-board plough for forming drills, £2. James Barclay, Castleton, Fowlis, Crieff.

For the best two-horse grubber or cultivator, working on the flat, £2. Robert Law, Shettleston, Glasgow.

For the best Norwegian harrow, £3. James Kirkwood, Tranent.

For the best land-presser for preparing seed beds for grain, £3. David Galloway, Cumno, Alyth.

For the best pulverizing land-roller, £3. Gibson and Richardson, Newcastle-on-Tyne.

For the best harrows, £2. William Crosskill, Beverley.

For the best equalizing swing trees or draught bars, £1. James Kirkwood, Tranent.

For the best broadcast sowing machine for grain and grass seeds, £3. John Lennie, Lauder Barns, Lauder.

For the best drill sowing machine for grain, £3. Thomas Sherriff, West Barns, Dunbar.

For the best horse-hoe for drilled grain crops, £4. Thomas Sherriff, West Barns, Dunbar.

For the best liquid-manure distributing machine, £3. William Herkless, Glasgow.

For the best liquid-manure pump, £1. A. and W. Smith and Co., Paisley.

For the best straw-cutter for hand labour, £2. Richmond and Chandler, Manchester.

For the best straw-cutter for power, £3. Richmond and Chandler, Manchester.

For the best turnip-cutter for sheep, £2. James Kirkwood, Tranent.

For the best turnip-cutter for cattle, £1. C. D. Young and Co., Edinburgh.

For the best turnip-cutter for sheep, adapted for attachment to a cart, £3. John Hutchison, Craigend, Perth.

For the best linseed-bruiser for hand labour, £2. Richmond and Chandler, Manchester.

For the best grain-bruiser, for hand labour, £2. A. and W. Smith, Paisley.

For the best grain and linseed-bruiser, for power, £3. Richmond and Chandler, Manchester.

For the best steaming apparatus, for preparing food, £3, equally between Richmond and Chandler, Manchester, and A. and W. Smith, Paisley.

For the best one-horse farm cart, £3, Alexander Scrimgeour, Methven, Perth.

For the best light spring cart, for farm or other purposes, £2, William Crosskill, Beverley.

For the best stone or iron stack pillars, with framework, £2. Young, Peddie, and Co., Edinburgh.

For the best hay tedding machine, £2, Richard Hodgson, of Carham, Coldstream.

For the best horse stubble or hay rake, £1. Lawrence Oliphant, of Condie, Perth.

For the best improvement on any part of the thrashing machine, £5. Peter M'Lellan, Bridge of Earn, Perth.

For the best thrashing machine, not exceeding two horse power, £6. Robert Stewart, of Carphin, Lanarkshire.

For the best dressing fanners, for grain, £3. Robert Reid, Leysmill, Forfarshire.

For the best weighing machine, indicating from 1lb. to 2 tons, £3. A. and W. Smith, Paisley.

For the best churn, worked by hand, £2. Peter M'Lellan, Bridge of Earn, Perth.

For the best churn, worked by power, £2. Charles D. Young, and Co., Edinburgh.

For the best cheese press, £1. Macartney and Drummond, Cumnock, Ayrshire.

For the best field gate, constructed entirely of iron, £1. Thomas Corrie, Perth.

For the best set of traverse divisions, rack and manger for farm stables, £2. Charles D. Young, Edinburgh.

For the best set of farm harness, premium equally between James Dunlop, Haddington; Hunter Allan, Kelso; and Alexander Russel, Pitmachie, Aberdeenshire.

For the best set of tiles and pipes, for field drainage, the premium of £1 equally between James M'Alpine, Stirling, and Alexander Meldrum, Seafield Tile Works, St. Andrews.

For the best set of glazed socketed pipes, for sewerage, £1. The Aberdeen Brick and Tile Company, Aberdeen.

For the best set of tools for cutting field drains, premium to William Cadell, Sons, and Co., Cramond.

For the best set of tools, for cutting open drains in hill pastures, premium to William Cadell, Sons, and Co., Cramond.

For the best apparatus for preparing flax, £10. A. and W. Smith and Co., Paisley.

For the best reaping machine, the premium of £20 to be awarded on Friday, August 6th.

EXTRA IMPLEMENTS, &c.

The following were commended:—

Patent eccentric mill—William Crosskill, Beverley.

Set of patent cart-wheels and axle—W. Crosskill, do.

Large grubber—James Kirkwood, Tranent.

Sheep fodder rack—James Kirkwood, Tranent.

Combined double mould-board plough, manure-rutter, and seed-sowing machine—Thomas Reid, Monkton Miln, Ayrshire.

30-inch or horse-power grass-cutting and rolling machine—Alex. Shanks and Son, Arbroath.

Rick and stack ventilator—Francis Somner, seedsman, Kelso.

Drain pavement for byres—John Quarton, Cuttlehill Tile-works, Crossgates.

Staple-maker for wire-fences—Thomas Dover, Croftinloan, Pitlochry.

Bee-hives—Robert Halket, High-street, Perth.

Self-balancing dog-cart—George Thomson, Stirling.

Diamond harrows—James Slight, Edinburgh.

Rhomboidal harrows—James Slight, Edinburgh.

Odometer—James Slight, Edinburgh.

Vases, pedestals, chimney-cans, &c.—Grangemouth Coal Company.

Chimney-vases, bricks, ovens, &c.—John Wauchope, of Edmonstone, Edinburgh.

Wire-netting—Thos. Gorrie, Perth.

Wrought iron carriage gate—Young, Peddie, and Co., Edinburgh.

Two six-barred hurdles—Young, Peddie, and Co., Edinburgh.

EXTRA STOCK.—COMMENDATIONS.

CATTLE.

Shorthorn heifer, 2 years 8 months old, belonging to William Stirling, of Keir, Dunblane.

Cow and calf, highly commended, belonging to Hugh Watson, Keillor, Coupar-Angus.

Two cross heifers, belonging to William Dingwall, Ramornie, Fifeshire.

Two cross oxen, belonging to George Brown, South Quarter, Kingsbarns, St. Andrews.

Tuscany cow, belonging to Colonel Fergusson, Raith, Kirkcaldy.

Crosss heifer and ox, belonging to James L. Miller, Wauk Mill, Dunfermline.

Six Highland oxen, belonging to the Earl of Glasgow.

Two Highland oxen, belonging to the Marquis of Breadalbane.

Four Highland heifers, belonging to the Marquis of Breadalbane.

Highland heifer, belonging to the Hon. Lady Menzies, of Menzies.

Highland heifer, belonging to James Archibald Campbell, of Inverawe.

HORSES.

Clydesdale stallion, belonging to Robert Arkley, Phillipston, Queensferry, highly commended.

Carriage stallion, belonging to Robert Mackay, Dalkeith, highly commended.

SHEEP.

Five Southdown lambs, belonging to Robert Scot Skirving, Campton, Haddington.

Five Romney-Marsh ewes, and five Romney-Marsh gimmers, belonging to David Park, Tynefield, Dunbar, commended as a breed likely to be useful in crossing with sheep for high pastures.

Five Romney-Marsh wethers, belonging to John Brown Wright, Hedderwick Hill, Dunbar.

OBSERVATIONS ON A NEW KIND OF POTATO.—A paper was read by M. Decandolle before the Academy of Sciences of Paris, on the 3rd of May last, containing some interesting observations relative to the potato. M. D. stated that he received last Sept. a communication to the effect that some growers in the department of Ain, having a friend in Mexico, had obtained from him a wild variety of the potato which was free from disease, while all the other crops in the neighbourhood were attacked. On receiving this intelligence, he went immediately to the place to investigate the matter. He found the new variety had been planted for two years by several persons, and that no trace of disease had yet been discovered in it, while all the other kinds were more or less affected. It was on the 2nd of September that M. Decandolle made his visit. Most of the common potatoes were then withered from the lateness of the season, or as the effect of disease. The Mexican variety was in a vigorous state of growth and in bloom, the flowers being larger and more deeply coloured than in the ordinary kinds. The berries also were larger. M. Decandolle examined the plant, and on comparing it with the common varieties of Solanum tuberosum, was led to consider it a distinct species. On his return he pursued the investigation, and came to the conclusion that the plant was not S. tuberosum, but S. verrucosum, of Schlechtendal; or, if not absolutely identical with the latter species, resembling it much

more than the former. The crops were left in the ground all the winter; on being taken up in the spring of the present year they were still perfectly sound, though at that time scarcely a sound tuber of the ordinary kinds was to be found in the vicinity. They were generally of small size, and the flesh was of an intense yellow colour. This was so strongly marked as almost to form a specific character. They were found to have an excellent flavour, and were quite free from the bitter taste usually characterising the wild varieties of S. tuberosum; their quantity of fecula was, however, considerably less than in the common kinds. The question arises here whether cultivation would increase the number and size of the tubers, and augment the quantity of fecula, and whether they would still remain free from disease. M. Decandolle considers that the history of the potato, and some general physiological considerations, will throw light on these points. As to the sizes of the tubers, he quotes the celebrated botanist Clusius, who states that potatoes were first introduced into Europe, in 1588, by the Spaniards. The ordinary size of the tubers then was one to two inches. They did not ripen at Vienna before the month of November. No account is preserved of those introduced to England by Sir Walter Raleigh: but a third introduction from Virginia is spoken of by Gerard, from which we learn that the tubers were very small. This was evidently the Solanum tuberosum, and there is no question of its identity with the species described by Clusius. The smallness of the tubers at the first introduction of S. tuberosum, contrasted with their ordinary size at present, leads to the inference that cultivation would increase the size of the new species also. It would likewise, in all probability, ripen earlier. These are changes of frequent occurrence in plants. The next question is, whether cultivation would increase the quantity of fecula. This M. Decandolle thinks probable, but doubts if it would be an advantage. An excessive production of fecula in plants he considers analogous to an overgrowth of fat in animals; and causing disease, either directly or indirectly, by enfeebling various parts of the organization. He regards the potato disease itself as an argument in favour of this position. Its prevalence in so many different countries, and under such different circumstances of soil, climate, &c., precludes the possibility of referring it to any merely local causes, and in M. D.'s opinion, even to general causes, acting externally. He therefore seeks a cause within the plant itself—whether direct or indirect is not material, provided it be general. Such an internal cause he considers he has found. It is the uniform testimony of travellers that the Solanum tuberosum grows naturally on barren soils, often among rocks, and on the sands near the shore. In Europe the custom has been to plant it in rich soils, and to manure abundantly. A system thus opposed to the order of Nature could not always be pursued without some ill effect. In the animal world, a few generations subjected to an unnatural *regime* will produce a predisposition to hereditary disease. In man, constant subjection to a diet either too poor or too rich would be sufficient in four or five generations to produce a tendency to certain maladies.—*Revue Horticole.*

THE YORKSHIRE AGRICULTURAL SOCIETY'S MEETING AT SHEFFIELD.

(ABRIDGED FROM THE SHEFFIELD INDEPENDENT.)

This important society has now existed since 1837, and has held fifteen annual exhibitions. Three of these have been held in York, two in Leeds, one in Hull, and the minor towns of Northallerton, Doncaster, Richmond, Beverley, Wakefield, Scarborough, Thirsk, and Bridlington, have all been honoured by its presence. Not till this year, however, has Sheffield been the scene of one of its annual gatherings.

The entries of the last three exhibitions, as to the principal stock, present the following result:—

Thirsk	120 cattle.	71 sheep.	72 pigs.	198 horses.
Bridlington ..	99	96	56	151
Sheffield	110	102	126	105

The entries of poultry are 147; of pigeons 4; of rabbits 3.

The entries of implements were 395; some of these, however, including, not single articles, but groups. Among these was Wray's, Ridley's, Dray and Co's Hussey's improved and M'Cormick's reaping machines.

The prizes are as follows:—

Cattle, by the Society	£150	0
Sheep „	85	0
Pigs „	57	0
Horses „	117	3
Horses, by the Local Committee	15	0
Poultry „	30	10
Pigeons „	1	0
Rabbits „	0	8

In addition to these money prizes, four of the society's first-class and four of the second-class silver medals were placed at the disposal of the judges, to be given for extra stock.

A novel prize, not contained in the catalogue, was placed at the disposal of the Local Committee by Mr. Bright, goldsmith and jeweller, Market place. It consisted of a valuable time-piece, standing seventeen inches high and seventeen broad, set in a metal casting, electro-plated in silver and gold, the design being appropriate to agricultural pursuits. The design represents a hillock, on the crest, sides, and base of which are displayed various agricultural implements, while it is surmounted by a peasant youth giving a handful of hay to a farm-horse, which stands in the sling-gears as just released from the plough. Among the implements are the plough, the hoe, the fork, the reaping-hook, the ditcher's spade, &c., &c. The horse is plated with silver, and the rest of the design in gold. A special meeting of the Local Committee was held at the Council Hall, on Tuesday noon, to decide on the appropriation of this beautiful present. The Chairman (W. Overend, Esq.) and members of the committee expressed to Mr. Bright, in the strongest terms, their sense of the liberality and good taste which he had shown in adding to the prizes a gift at once so valuable and appropriate. It was at first proposed that it should be given to the most deserving exhibitor of

stock or implements; but after some conversation, it was decided to confine it to the exhibitors of stock; and Messrs. Overend, Hounsfield, and Hinde were appointed a sub-committee to confer with the judges as to the person best entitled to the distinction of the most deserving exhibitor of stock. It was also arranged that the prize should be presented by the Local Committee to the fortunate competitor, at a special meeting, on Friday noon, at the Council Hall.

IMPLEMENTS EXHIBITED.

Wm. P. Stanley, Peterborough.—Chaff engine, roller mill, steaming apparatus, iron plough, iron skim and paring plough, roller mill, universal mill.

W. Sawney, Beverley.—Winnowing machines and blowing machine.

C. Lambert, Sunk Island, Hull.—Turnip scuffler, and grubber, and potato hanker, sheep trough.

T. Bigg, Great Dover-street, London.—Sheep and lamb dipping apparatus.

T. Walker, Wooton, Ulceby.—Corn and seed drill, combined drag and scarifier, set of harrows for strong land, ditto for light land, horse rake.

J. Harpley, Guisbro'.—Plough for three depths, 9, 7, and 5 inches.

W. Ross, Greatham, Stockton.—Plough for three depths, 5, 7, and 9 inches.

W. Busby, Newton, Bedale.—Ploughs, horse hoes, horse rake, two-horse scarifier, gravel screen, barley hummeller, carts, corn chaff machine, paring plough, patent horse rake, sets of harrows.

Gibson and Richardson, Newcastle-on-Tyne.—The Northumberland clod crusher.

John Wray, Leeming, Bedale.—Reaping machine.

James Teale, 114, High-street, Leeds.—Straw or hay cutters, linseed cake breaker, turnip drill.

H. I. Morton, Albion street, Leeds.—Liquid manure pumps and other pumps, pig and sheep troughs, spouts, gutters, pipes for water, stench traps for large drains, pig pails, cans, and other specimens of galvanised iron manufacture; game and sheep netting, patent straw or wire rope fencing, and other specimens of wire work.

Clayton, Shuttleworth, and Co., Lincoln.—Six-horse portable steam engine, registered combined thrashing, straw shaking, riddling, and winnowing machine; five-horse portable steam engine, portable grinding mill, saw table, two-knife chaff cutter, sack holder.

John Jones, 33, Westfield terrace, Sheffield.—Gutta percha galoshe, to be worn by sheep for the cure of the foot rot, manufactured by the Gutta Percha Company, City road, London, expressly for the inventor and patentees, J. Jones and Co. Sizes, No. 1, 3s. per dozen; No. 2, 4s. per dozen; No. 3s, 5s. per dozen. Entirely new.

W. Smith, Kettering.—Winnowing machine, horse hoe.

W. Pearson and Co., Leeds.—Machine for washing, wringing, and mangling, machine for wringing and mangling.

T. Moore, Hayton, Retford, Notts.—Seven-horse portable steam engine, machine for ditto.

Richard Hornsby and Son, Spittlegate Iron Works, Grantham.—Six-horse power patent portable steam engine, four-horse power patent portable steam engine, patent improved combined thrashing machine, patent corn dressing machine, drill for general purposes, patent corn and seed drill, patent fore carriage steerage, four-row patent turnip and manure drill, patent turnip ridge drill, double cake crusher, single cake crusher, Cornes' two-knife chaff cutter.

S. Hutchinson, Manthorpe Lodge, Grantham.—Cast iron drain receiving grate, cast iron drain discharging grate, brick drain respirator, mould for making ditto, outfall drain tile with insertion hole, mould for insertion hole, minor draining tile.

R. E Ridley, Hexham.—Reaping machine, Pattinson, Davidson, and Co., makers; inventor, R. E. Ridley. New implement. £30.

W. Robson, Leeming, Bedale.—Plough for deep ploughing, plough for general purposes, swing plough, scuffler.

W. Dodds and Co., Leadenhall-street, London. Urwin's patent double-acting lift and force pump.

Henry Kearsley, Ripon, York.—Iron tile machine, Ducie's drag and scarifier, Norwegian harrow, press for bricks and pantiles, horse rake.

B. Stead, Gateforth, Selby.—Malleable iron ploughs, sets of patent harrows, expanding horse hoe for ridge, horse hoe for ridge, patent harrows, ox harrows, improved hand hoes.

J. Barker, Donnington, York.—Iron wheel ploughs, iron double mould ridging plough, iron skimming plough, iron subsoil pulverizer, patent iron zig-zag harrows, for light and for strong land; pair of jointed expanding ridge harrows, iron horse hoes, with single and double Norwegian harrows; iron parallel horse shoe, five-tined drill grubber, two-horse grubber or drag harrow, strong scarifier or drag, scarifier, variety of whippletrees, set of equalizing three-horse draught bars, iron improved stubble rake, Yorkshire one-horse carts; one-horse Lister cart, maker G. Barker, inventor Wm. Lister, Esq. This cart is so constructed as to regulate the gravity of the load going up or down a hill, by taking the pressure off the horse's back down the hill, and likewise the pressure off the belly-band up the hill; and the body of the cart is so low that a boy can load or unload it as well as a man with the ordinary cart; and it is not so easily upset on rough ground or hill sides—£10. One-horse Lister cart, portable thrashing machine, improved dressing machine, hand turnip cutter. Mr. Barker exhibits a great variety of other ploughs, harrows, and other implements.

John Plant, Birley, Sheffield.—Turnip cutter, for beast, maker and inventor, J. Plant, £1 15s.; turnip cutter, for sheep, maker and inventor, J. Plant, £2 5s.; turnip cutter, for sheep, maker, Bernard Samuelson, inventor, Mr. Gardner, £4 10s.; set of harrows, wood, maker and inventor, J. Plant, £2 8s.; set of harrows, wood, maker and inventor, J. Plant, £2 4s.; set of harrows, wood, maker and inventor, J. Plant, £2 2s.; set of harrows, wood, maker, J. Plant, £2 10s.; set of harrows, iron, maker, George Bailey, £2 10s.; metal roller, maker, J. Plant, improved wrought iron ends, £5 15s.; linseed cake mill, maker, J. Plant, improved box to preserve the small, £3; land presser, maker, J. Plant, improved scrapers, £4 15s.; turnip drill on the ridge, maker, George Bailey, £4 15s.; scarifier, maker, George Bailey, £4 15s.; horse rake, wood, maker, John Plant, improved to let the stones pass through the teeth, £5 10s.; horse rake, iron, maker and inventor, John Plant, £6 5s.; horse rake, iron, maker, Fred. Howard, £6 5s.; iron plough, maker, Fred. Howard, £3 12s. 6d.; swingletrees, maker, Fred. Howard, 13s.; scuffler, maker and inventor, John Plant, £1 6s.; churn, maker, Mr. Drummond, £2 6s. 6d.; three-horse peg thrashing machine, maker, Mr. Thackray, £26; hay forks, maker and inventor, John Plant, 3s. 6d.

W. V. Feast, Salford, Manchester.—Parallel lever subsoil pulverizer, improved subsoil pulverizer, strong deep soil "Scotch" plough.

G. Drayton, Worksop.—Double horse plough.

John Adamson, Bramley, Rotherham.—Lever paring skim, or scarifier, maker John Adamson, inventors Edward Hill and Co., £4 10s.

Smith and Ashby, Stamford.—Patent haymakers, patent lever horse rake, patent lever hand rake, cultivator, 18-inch patent chaff and litter cutter, 18-inch chaff and litter cutter, chaff machines, luggage cart, farm carts, patent wrought-iron wheels.

E. Hill and Co., Brierley Hill Iron Works, Dudley.—Wrought-iron skim or pair horse scarifiers, registered expanding wrought-iron horse hoe, wrought-iron horse hoe, wrought-iron sheep rack, iron hurdles, iron fencing, wrought-iron field gate, iron gates, and gates and posts, wrought iron deer rick stand, wrought iron garden seat, wrought iron barrow, barrow with heating apparatus, specimens of game proof netting.

Barrett, Exall, and Andrews, Katesgrove Iron Works, Reading, Berks.—Two horse power patent portable thrashing machine, new cylindrical fixed steam engine, new patent portable steam engine, patent chaff cutters, paragon mill, oilcake crusher, patent horse rake.

John Bellerby, York.—Registered one horse carts, harvest raves or shelvings, registered wheels and axle, specimen of large axle.

John Martin, Notton, Wakefield.—Patent American railroad, horse power for driving thrashing or other machines, one horse power, makers and inventors Emery and Co., of Albany, United States of America; patent turnip cutter, land roller.

Richard Coleman, Chelmsford.—Drag harrows and scarifiers, expanding harrows.

Robert Awdas, Sheaf-street, Sheffield.—Improved iron drag or scarifier, three or four horses, maker and inventor Robert Awdas, improved, 8*l.*; improved light scarifier, maker and inventor Robt. Awdas, improved, 4*l.* 4s.; horse hoe on the flat, maker and inventor Robt. Awdas, improved, 2*l.* 15s.; horse hoe on the ridge, maker and inventor Robt. Awdas, improved, 2*l.* 10s.; one set of three horse swingletrees, maker and inventor Robt. Awdas, 1*l.* 10s.; single rowed corn drill, maker Robt. Awdas, 10*l.*; hand corn drill, maker and inventor Robt. Awdas, 3*l.*; field roller, the barrel in three parts, maker and inventor Robt. Awdas, 7*l.* 7s.

Alfred Earnshaw, 28, Spital Hill, Sheffield.—Caastrating knife for lambs, maker and inventor Alfred Earnshaw, 1*l.* 4s. per dozen, or 2s. each.

Pickering and Houlgate, Beverley, Yorkshire.—Dog cart, improved silver mounted harness, model of a horse.

Fowler and M'Collin, Hull.—Portable steam engine, thrashing machine.

George Meynell, Northallerton.—Ribbing plough and drill, swing plough (No. 1), wheel ploughs, cattle feet clipper, improved spring bull rings.

John Goucher, Woodsetts, Worksop.—Six horse portable steam engine, maker and inventor, W. Bailey, Northampton, improved, £150, if felted and lagged £5 extra. The improvement of the above engine consists of the cylinder being placed in the smoke box, whereby a saving of fuel is obtained, the cylinder being surrounded with hot air, the strength of the steam is maintained until it operates on the piston; 7-inch cylinder, 14-inch stroke, makes 103 revolutions per minute, craft shaft 3 inches in diameter and of wrought-iron; fly wheel 5 feet in diameter, weight 5 cwt. 2 qrs.; time to get up steam 40 minutes, and 80lbs. of fuel required; fuel per horse-power per hour, 6lbs.; thickness of boiler plate for fire box $\frac{3}{8}$, barrel 5-16ths, and smoke box $\frac{1}{2}$ inch. Three horse power thrashing machine, 4-horse portable bolting thrashing machine, 5 horse power stationary bolting thrashing machine, a new straw shaker.

James Hart, the Atlas Iron Works, Borough-road, London.—Brick machine and tools, vertical tile and hollow brick machine, horizontal tile and hollow brick machines, pug mill, one horse work.

William Crosskill, Beverley, Hull.—Nave wheels and axle, wheels and axles, Newcastle model cart, Lewes prize cart, Norwich prize cart, pair horse waggon with set of $2\frac{1}{2}$ in. tire, wheels, axles, and double break, liquid manure carts, double force pump, liquid manure pump, road sweeping machine, farm railway, thrashing machine, portable power mill, cake breaker, turnip cutter, hand straw cutter, power straw cutter, potato washer, root washer, fixture pig trough, circular pig troughs, Yorkshire wheel plough, prize wheel iron plough, prize iron seed harrow, prize iron two-horse harrows, prize Norwegian harrow, Belgian ring roller, Crosskill's prize roller, Yorkshire Wold presser, scarifier, cultivator, or broadshare plough, Ducie's drag Yorkshire Wold drill haymaker, iron horse rake, Hussey's reaper, maker Crosskill, inventor Hussey, U. S.; Hussey's reaper, maker Crosskill.

George Hurwood, Ipswich, Suffolk.—Hurwood's patent metal mill, Hurwood's patent mill, model to illustrate the principle of the patent mills, sample box.

James Teal, Holme, Beverley.—Iron ploughs.

William Primrose, Westbar, Sheffield.—Glass pipes, rough plate and sheet glass tiles and slates, rough plate domes, ditto milk pans and trays, perforated ventilating glass, roll and fluted rough plate glass, various patterns; cast plate glass, rough; sheet glass, various strengths; glass pastry pins, propagating glasses, various sizes; flower pots, cucumber glasses, &c.

Burgess and Key, Newgate-street, London.—Reaper, makers Burgess and Key, inventor C. H. M'Cormick, £25; pumps, churns, odle forks, set of draining tools, gal. iron lift pump, suction pump, delivery hose, delivery leather, two jets, six union joints.

Joseph Demain, Markington, Ripley.—Reaping machine.

Robert Sorby and Sons, Carver-street, Sheffield.—Assortment of scythes, reaping hooks, and sickles, makers and inventors R. Serby and Sons, improved; assortment of the old patent scythes, assortment of hay, chaff, and straw cutting machine knives, makers R. Sorby and Sons, improved; assortment of sheep shears, assortment of hoes, assortment of hedging and switching bills and axes.

Charles Burrell, Thetford, Norfolk.—Six horse power portable thrashing, shaking, and riddling machine, patent Northumberland clod crusher, gorse cutting and bruising machine, or universal corn and seed crusher, circular saw bench, or machine for making hurdles or gates.

J. Hookin, Weigh Lane, Duke-street, Sheffield.—Common plough, with cast steel breast, to plough 5 inches deep, maker and inventor J. Hookin, improved, £5.

R. and J. Harriss, Rotherham.—Land roller, 6 feet long, 2 feet diameter, makers and inventors R. and J. Harriss, £11 10s.

Tuxford and Sons, Boston.—Four horse power patent portable housed steam engine, six horse power improved fixed steam engine, patent combined thrashing, shaking, and blowing machine.

Richmond and Chandler, Salford, Manchester.—Newly invented chaff machines, corn crushers, linseed crusher, lawn

mower, Richmond's chaff machine, steam apparatus, sack holders.

William Dray and Co., Swan Lane, London.—Reaping machine, makers W. Dray and Co., inventor Hussey, improved, £18; winnowing machine and blowing machine combined, chaff engine and litter cutter combined, drag or scarifier.

Sandy Mudford, Exchange, Sheffield.—Rick cover, made of white ship canvass unoiled, maker and inventor Saudy Mudford, £8 8s.

William Bell, Rothwell, Kettering.—Ploughs, scuffler, and scarifier. .

Norton and Borie, 33, Thornhill Square, Richmond Road. Islington.—Drain tile machine.

Whitwell and Chapman, Clerkenwell.—Corn crusher.

Charles Green, Barton.—Peg thrashing machine and straw shaker.

C. D. Young and Co., Edinburgh.—An assortment of implements.

Jeremiah Waudby, York.—Portable steam engine.

Wm. Barratt, St. John's Nursery, Wakefield.—Specimens of grown grasses, grass seeds, &c.

In this department, as a reference to the entries will show, there was a great variety of important and useful machines and implements, chiefly adapted to agricultural purposes. First and foremost stands the plough, two of the highest prizes for which are deservedly awarded to Mr. Busby, and a prize of equal merit to Mr. Hall. The reaping machines rank, perhaps, next in value to the farmer, and produced unusual attraction. But as these machines are mentioned in another part of our report, it is unnecessary to make any further remark, than that the prize has been awarded, as was anticipated, to Messrs. Burgess and Key, the makers of M'Cormick's machine. The highest premiums have been awarded to Messrs. Hornsby, for their portable steam engine, and to Messrs. Tuxford for their fixed engine. The next highest prize has also been won by Messrs. Hornsby, for their thrashing and winnowing machine, Two brick machines were at work on the ground, and caused much discussion as to their economising labour, &c. The judges awarded a small premium to Norton and Borrie, for their tile or perforated brick machine. The rest of the prizes were also of a minor character. Crosskill still maintains his supremacy as the inventor of the well-known clod crusher, and distances all competitors. Of the society's medals, one was awarded to Mr. Robert Awdas, of this town, for his improved iron drag, or scarifier. Messrs. R. Sorby and Sons exhibited an assortment of scythes, hay and machine knives, sheep shears, hoes, hedging bills, axes, &c., for which there was no competition. Messrs. Spear and Jackson introduced to the notice of farmers and others a variety of American two and three-grained steel forks, manufactured at Etna Works, and possessing great superiority over the old-fashioned hay forks hitherto in use. Gutta percha galoshes, for the prevention of foot-rot in sheep, by John Jones and Co., of Patent Works, in this town, were commended to the attention of farmers as a remedy for this prevalent disease in wet seasons. Messrs. Harris, of Rotherham, had no competitors in their class for a land roller.

The following gentlemen were selected as

JUDGES.

Implements.—Mr. Peter Love, of Naseby, Northamptonshire; Mr. Wm. Hislop, of Woolley, Wakefield; Mr. Peter Stevenson, of Renton, Thirsk; Mr. Thomas Outhwaite, of Baineas, Catterick; and Mr. Amos, C.E., of Southwark, London.

Cattle.—Mr. John Moor, of Badsworth, Pontefract; Mr. Thomas Tindall, of Wheatley; and Mr. J. F. Butter, of Thorngumbald, Hadon.

Cows for Dairy Purposes.—Mr. T. Turner, of Eastwood, Rotherham.

Sheep and Pigs.—Mr. W. E. Hobson, of Kettleby Thorpe, Brigg; Mr. John Brown, of Ranbrook, Wakefield; and Mr. Charles Hudson, of Blythe, near Bawtry.

Horses.—Mr. Geo. Gurnell, of Sturton, Brigg; Mr. Thos Sorby, of Newton Morrell, Darlington; and Mr. Charles Garfitt, of Tably Hall, Knutsford.

Poultry.—Mr. T. H. Travis, of York, and Mr. Edward Bond, of Leeds.

Field Committee.—Mr. M. J. Ellison, of Sheffield; Mr. Wm. Fowler, Sheffield; and Mr. Vincent Corbett, of Outhwaite Hall, Wortley.

TRIAL OF IMPLEMENTS.

The trial of ground implements, as announced in our last, took place on Tuesday, Aug. 3. The land is in the occupation of Mr. Benjamin Seaman. In the advertisement the ground was described as "near the Old Slitting Mill, Attercliffe," but it turned out that few persons knew where the Old Slitting Mill was. Our readers will best understand us when we say that the fields were behind the New Connexion Chapel, on the level ground between Attercliffe and the river. It had been arranged that the reaping machines should be tried there at seven on Tuesday morning, and several gentlemen were on the ground to see them, but it was found that the object could not be accomplished, and it was not till between ten and eleven that the reaping machines arrived on the ground and were put to the test. Each field was about three acres in extent, one of cloverley, and the other of a strong crop of oats. Excepting that the ground was extremely hard and dry, the former was admirably adapted for testing the respective merits of the ploughs. The soil is very deep and free from stony obstructions, the land being chiefly warp, on the site, probably, of an ancient fen or marsh, which, by the overflowing of the adjoining river and drains, has occasionally received the valuable deposits of warp so often met with under similar circumstances. The ploughs entered for trial were by the following makers:—Mr. Prockter, Peterborough; Mr. John Harpley, Gainsbro'; Mr. W. Ross, Greatham; Mr. W. Busby, Newton; Mr. Robson, Leeming; Mr. B. Stead, Gateforth, Selby; Mr. Barker, Dunnington; Mr. John Plaut, Birley, near Sheffield; Mr. George Drayton, Worksop; Mr. G. Meynell, Northallerton; Mr. Crosskill, and Mr. James Teal, Beverley; Mr. J. Hookin, Sheffield. It is not necessary for us to particularize the respective merits of the ploughs. The judges have awarded priority to the best. We may here venture an opinion, however, that many of the ploughs are scarcely adapted to the strong and stiff clays of this locality. The draught of several of them appeared enormous, each requiring the united strength of four powerful horses to work it. The ploughs seemed to us admirably constructed for turning over sandy or loamy soils. Still, on the whole, taking the dryness of the ground into consideration, the performances of these necessary implements were very satisfactory. In the skill of the ploughmen there was great similarity, with one exception only. The labourer who held one of Busby's ploughs commenced and completed his work in a style of excellence rarely to be seen.

The other implements tried were of the usual and ordinary character, such as clod-crushers, drags, subsoil ploughs, &c., &c., and their performances call for no particular observation. During the trials heavy rain came on, but not sufficiently to damp the zeal of spectators, who were numerous. The reaping machines were of course the great object of curiosity, and were followed by the criticisms of crowds. When it is observed that their prices range only from £18 to £25 each, and that they are computed to save one-half in the reaping of corn, as well as to perform it with the expedition necessary in critical weather, it is obvious that a conviction of their efficiency must soon cause a very large demand for them. The machines were modifications of the American machines of M'Cormick and Hussey. The cutting apparatus of the latter consists of a series of knives, which, by a lateral motion, obtain a cutting power similar to that of a pair of sheara; while M'Cormick's machine, on the contrary, operates on the saw principle. M'Cormick's machine is not calculated to cut the crop without leaving the stubble at the height of five or six inches. Hussey's (at least Crosskill's specimen of it) cuts the straw close to the ground. The latter, however, in the opinion of numerous witnesses, did not on this occasion finish its work so satisfactorily as the machine of M'Cormick. The crop, when cut, was less compact and more spread about than that cut down by M'Cormick's machine. We doubt, too, from the manner of bringing the straw to the platform, that there must be considerable waste by beating out the grain, especially when ripe, in the use of the formidable rake used by the man on Hussey's machine.

WEDNESDAY, August 4.

Members of the society were admitted to the ground this morning at ten, and the public by half-crown tickets for gentlemen and shilling tickets for ladies at twelve. It was very gratifying to see the interest excited among our townsmen of all sects, parties, and grades of life. Multitudes were present to-day whom scarcely any other inducement would have led to anticipate the shilling day. The weather, except slight occasional showers, which kept down the dust, was favourable, and the ground presented a very animated scene.

Among the company on the show ground were—The Earl of Carlisle, Earl of Effingham, Sir J. V. B. Johnstone, Bart, M.P.; Hon. and Rev. S. W. Lawley, Escrick, York; Hon. and Rev. W. Howard, Whiston; W. B. Wrightson, Esq., M.P. for Northallerton; J. G. Smythe, Esq., M.P. for York; John Parker, Esq., Tickhill; Leonard Thompson, Esq., Sheriff Hutton Park; J. Carr, Esq., Mayor of Sheffield; Wilson Overend, Esq.; T. Dunn, Esq.; R. Sorby, Esq.; J. Haywood, Esq.; E. Vickers, Esq.; W. Webster, Esq., Master Cutler; H. Hudson, Esq., Capital Burgess.

The exhibition of stock was of a first-rate character. The bulls and heifers astonished the farmers in this district. Such magnificent specimens were never before witnessed here. Mr. Towneley's cows and heifers were especially admired for their freshness, symmetry, and general perfection. Indeed, it was quite a treat to the farmers here to have an opportunity of seeing such rare animals. The bulls were also equally excellent, and we have much pleasure in believing that the exhibition of this very superior class of animals will be the means of introducing an improved breed in this neighbourhood. It is admitted that several of a superior class are already kept within a short distance, and among these may be mentioned the bulls of Earl Fitzwilliam, the Duke of Devonshire, J. Fullerton, Esq., of Thryburgh; B. H. Brooksbank, Esq., of Tickhill; Wm. Hounsfield, Esq., Tinsley; John Hall, Esq., Kiveton; Joshua Knowles, Esq., Tinsley, &c.; but the use of these animals is only within the reach of the more affluent farmers and breeders. The calves were fine animals of their breed, and attracted considerable attention. It would be useless to attempt to describe here the particular merits of each animal, when all appeared to claim nearly equal commendation. The steers and fat heifers shown to day certainly excelled in the aggregate anything of the kind ever shown in Sheffield. A splendid barren roan heifer, the property of Mr. Fletcher, of Radmanthwaite; and another, the property of Mr. Charles Towneley, of Towneley Park, are deserving of especial mention. It will be seen that the latter gentleman was again a successful competitor in this class. In awarding the prize, the judges appeared to entertain some difficulty, and no wonder, when the animals were so equally excellent. The rams and ewes were, with few exceptions, a credit to their owners, but it was quite evident that in some instances great pains had been taken in "making them up" for the show. The South-downs were the favourites. The exhibition of pigs was large, and the owners of this class of animals, both great and small, received at least a full share of praise from numerous admirers. The obesity of most of the porcine groups resembled more a Christmas than a midsummer show. To give our readers an idea of the value placed on these animals, we can inform them that the owner of one pen of three, ten weeks old, asked the sum of ten guineas per head! Of the horses there was but a meagre show, both in number and quality. The entire horses were most admired, and some of them possessed superior merit.

The show of poultry, like that of cattle, &c., was quite a novelty in Sheffield, and created great curiosity among the admirers of the feathered creation. We judge from the number of empty cages, that the competition for poultry honours was not quite so numerous as was expected. Still the number shown was respectable, and proved that a growing interest is being taken in the improvement of the various breeds of barn-door and other fowls. The prices attached in the catalogue to some of these birds were extraordinary. To a cock the price affixed was £20; another, £10; Cochin China cock and two hens, £30; ditto, £10, &c., &c.

AWARDS FOR IMPLEMENTS.

Best nine-inch Plough, Mr. Ball	£5
Best seven-inch Plough, Mr. Busby	5
Best five-inch Plough, Mr. Busby	5
Harrow for light land, Mr. Stead	3
Drag or Scarifier, Mr. Smith, Stamford	5
Horse Hoe on the flat, Mr. Smith, Kettering	5
Ditto on the ridge, Mr. Busby	2
Portable Steam Engine, Mr. Hornsby	15
Winnowing Machine, Mr. Hornsby	5
Thrashing Machine with Winnower, Mr. Hornsby	10
Drill the most useful, Mr. Hornsby	5
To Mr. Hornsby—Cake Mill	2
Fixed Steam Engine, Messrs. Tuxford and Sons	15
M'Cormick's Reaping Machine, Burgess and Key	6
Single-horse Cart, Mr. Bellerby	5
Ditto Crosskill's	Highly commended.
Thrashing Machine, Mr. Goucher	Medal
Patent Metal Meal Mill, Mr. Hurwood	Medal

MISCELLANEOUS.

To Mr. Crosskill—Best assortment of Implements in the yard..... The Gold Medal
„ Waggon £5
„ Liquid Manure Cart 2
„ Roller in parts for uneven ground.... 2
„ Wheels and Axles 2
To Mr. Smith, Stamford—Haymaker 3
To Barrett and Exall—Horse Rake 2
To Mr. Hill, Brierley Hill—Iron Gates and Hurdlea 3
To Norton and Borrie—Brick Machine 2
To Mr. Burrell—Saw Bench and Hurdle Frames..... 2
To Mr. Cogan—Dairy Utensils..... 2
To Mr. Sorby—Improved Scythes..... 1
To Burgess and Key—Double-action Pump..... 1
„ Assortment of Forks 1
To Mr. Busby—Chaff Cutter 2
To Mr. Barker—Subsoil Plough 2
To Mr. Hart—For the ingenuity displayed in the construction of his new Brick Making Machine ..... Medal
To Mr. Awdas—Improved Drag Lifter..... Medal

LIST OF PRIZES AWARDED.

SHORT-HORNED CATTLE.

The best bull of any age, 25*l.*, awarded to F. H. Fawkes, Farnley, Otley; second ditto, 10*l.*, to T. Raine, Gainford, Darlington—for Magistrate (21 entries). Commended—a red bull belonging to Henry Smith, Drax Abbey.

Best yearling bull, 20*l.*, awarded to Earl Fitzwilliam, Wentworth Rotherham, for Will o' the Wisp; second ditto, 5*l.*, to H. Ambler, Watkin Hall (10 entries). Commended—F. Jordan's bull.

Best bull calf, upwards of five months old, 10*l.*, awarded to R. Booth, Warlaby, Northallerton, for Windsor (11 entries). Commended—F. H. Fawkes's Master Charley.

Best cow of any age, in calf or milk, 15*l.*, awarded to Charles Towneley, Towneley Park, for Alice; second ditto, 5*l.*, to R. Booth, Warlaby, Northallerton, for Rose Blossom (17 entries). Commended—F. H. Fawkes's Millinent, and Charles Towneley's Ruby.

Best three-year-old cow, in calf or milk, and having had a calf, £10, awarded to Charles Towneley, Towneley Park, Burnley, for Butterfly, considered to be the best animal in the yard (4 entries.)

Best two-year-old heifer, in calf, £10, awarded to John Booth, Killerby, Catterick, for Venus Victrix; second ditto, £5, to R. Booth, Warlaby, Northallerton, for Bride (9 entries.)

Best yearling heifer, £10, awarded to Charles Towneley, Towneley Park, Burnley, for Frederica; second ditto, £5, to R. Booth, Warlaby, Northallerton, for Bridesmaid (11 entries.) Commended—Thomas Dunwell's Moss Rose.

Best heifer calf, upwards of five months old, £5, awarded to Charles Towneley, Towneley Park, Burnley, for Vestria (7 entries.)

CATTLE OF ANY BREED.

Best cow for dairy purposes, £5 awarded to J. Gordon, Lecalty, Manchester, for Moss Rose (4 entries.)

Best fat ox of any age, £5 awarded to Earl Fitzwilliam. Commended, Samuel Wiley, Brandsby, York (6 entries.)

Best fat cow or heifer of any age, £5 awarded to Sir Charles Towneley, Towneley Park, Burnley, for Ruby. Commended, W. Fletcher, Radmanthwaite, Mansfield, for Tulip. (9 entries.)

LONG WOOLLED SHEEP.

Best shearling ram, £20, awarded to J. Simpson, Spofforth Park, bred by him; second ditto, £5, to John Borton, Barton-le-street, Malton, bred by him (3 entries.)

Best ram of any age, £10, awarded to John Borton, Barton-le-street, Malton, bred by him; second ditto, £5, to W. Abraham, Barnetby-le-Wold, Brigg, bred by him (12 entries.)

Best pen of five ewes, £5, awarded to J. Simpson, Spofforth Park (7 entries.)

Best pen of five shearling wethers £5, awarded to W. L. Mellish, Hodsock Priory, Worksop, bred by him (5 entries).

Best pen of five shearling gimmers, £10, awarded to W. Abraham, Barnetby-le-Wold, Brigg, bred by him; second do., £5, to W. Jordan, Low Caythorpe, Burlington, bred by him (10 entries).

SOUTHDOWN SHEEP.

Best Southdown ram of any age, £10, awarded to G. S. Foljambe, Osberton Hall, Worksop, bred by him (18 entries).

EXTRA STOCK—SHEEP.

First prize awarded to Samuel Swift, Hemingfield, Barnsley; half-bred Southdown wethers; second ditto, to Robert Dawson, Sowerby, Burlington; one shearling ram (17 entries).

PIGS.

(10 competitors). For the best Boar, large breed, £5; Tinsley Hero, white, birth Oct. 11, 1850, s. Rex, d. Duchess 1st, Josh. Knowles, Tinsley, Sheffield, bred by him. Second ditto, £2; —— birth June 3, 1851, T. M. Richardson, Hibaldstow, Kirton Lindsey, bred by him.

(7 competitors). For the best sow, large breed, in pig or milk, £5; Yorkshire Lass, birth Sept. 21, 1849, W. Abbott, Woodhouse-lane, Leeds, bred by John Midgley. Second ditto, £2; Matchless, birth August 8, 1850, s. Dreadnought, d. by Old Matchless, J. Tuley, Matchless House, Keighley, bred by him.

(27 competitors). For the best Boar, small breed, £5; King of Diamonds, white, 3 years 1 month and 2 weeks, s. Cupid, d. by Prince, Timothy Town, Keighley, Yorkshire, bred by J. G. Sugden. Second ditto, £2; Ajax, white, birth August 7, 1851; s. Young Cruikshanks, F. Lacy, Panton, Wragby, bred by him.

(30 competitors). For the best Sow, small breed, in pig or milk, £5; —— birth July, 1851, s. Viscount, d. Harmony, William Fowler, Woodhill, Sheffield, bred by George Leather. Second ditto, £2; Sally the 8th, blue and white, birth 1848, s. Cupid, d. by ——, A. H. Smith, Snittles, Beeston, Leeds, bred by J. Heaton.

(14 competitors). For the best three Store Pigs, of the same litter, from four to nine months old, £5; —— black and white, birth Feb. 9, 1852, s. Thrybergh Boar, d. by Fisher's Old Boar, John Fullerton, Thrybergh Park, Rotherham, bred by him. Second ditto, £2; —— seven months, S. Thormanby, Lord Wenlock, Escrick Park, bred by his lordship.

(11 competitors). For the best Sow of any breed not qualified to compete in classes 21 or 23, £5; Charity, white and blue, birth March 2, 1851, s. Crookshanks, d. by Young Careful, R. Owston, Brigg, Lincolnshire, bred by him.

EXTRA STOCK, PIGS.

Nineteen competitors. J. Fullerton, Thrybergh Park, boar, bred by himself, 1; Lord Wenlock, Escrick Park, two Boar Pigs, bred by his lordship, 2. The other competitors were T. Smith, Woodhead House, Barnsley; R. J. Bentley, Eastwood House; G. Mangles, Ripon; W. Ludlam, Bradford; T. Hors-

fall, Otley; A. H. Smith, Snittles, Beeston; G. E. Taylor, Oatlands, Leeds; Vincent Corbett, Wortley; G. Hutchinson, York; John Rinder, Righton, Harewood; F. Ferguson, Walkington, Beverley; S. Wylie, Brandsby, York.

HORSES.

(6 competitors). For the best stallion for hunters, £10; Maroon, bay f. 1837, s. Mulatto, d. by Lottery, R. Stockdale, Skerne, Driffield, bred by Lord Eglinton. Second ditto, £3; Black Dwarf, black f. 1845, s. Voltaire, d. by Waverley, T. Groves, Plumpton Hall, Knaresborough.

(13 competitors). For the best stallion for coach-horses, £10; Lord John, bay f. 1849, s. Symmetry, d. by Old Volunteer, Thomas Danby, Rawcliffe, Selby, bred by Thomas Musgrove. Second ditto, £3; Zamor, bay f. 1847, s. Rimphon, d. by Rainbow, W. Burton, Water Fulford, York, bred by Mr. Dunn.

(5 competitors). For the best stallion for roadsters, £10; Bullet, chesnut, 3 years old, s. Turpin, d. by Revolution, Wm. Burton, Fulford. Second ditto, £3; Dandy, brown, s. Pope, d. by Byron, F. Newbold, Sheffield.

(17 competitors). For the best stallion for agricultural purposes, £10; Prince Albert, grey, 6 years old, s. Atlas, Thomas Renton, Otley, bred by Albany Renton. Second ditto, £3.; Shirwood Ranger, grey f. 1848, s. Crack Wagon, d. by Sampson, James Stead, Bishop Thornton, Ripley, bred by W. Calvert.

(4 competitors). For the best mare and foal for hunting, £5. Polly, brown, f. 1845, s. Lion, d. by Turk, f. by Sleight, of-Hand, J. Bainton, Wansford, Driffield, bred by R. Jarratt.

(3 competitors). For the best mare and foal for coaching, £5. ——, bay, f. 1844, s. Conqueror, J. Robinson, Leckby, Topcliffe, bred by Thomas Kirk.

For the best roadster mare and foal. ——, bay, 8 years old, s. Splendour, f. by Hountoun Merrylegs, S. Wylie, Brandsby, York.

(3 competitors). For the best mare and foal for agricultural purposes, £5. ——, brown, s. Great Britain, J. Fullerton, Thrybergh Park, Rotherham, bred by him.

(3 competitors). For the best three-year-old hunting gelding, £5. ——, brown, s. Ballinakell, d. by Brilliant, John C. Athorpe, Dinnington, bred by him.

For the best three-year-old hunting filly, £5. ——, chesnut, s. Comus, d. by Ascot, F. Wharton, Dunscroft, Hatfield, bred by him.

(5 competitors). For the best three-year-old. coaching gelding, £5. ——, bay, s. Cato, d. by Harpham Turk, J. Johnson, Brigham, Driffield, bred by J. Jackson.

(5 competitors). For the best three year-old coaching filly, £5. Nancy, bay, s. Venture, d. by King George, J. Smith, Marton Lodge, Burlington, bred by Richard Smith.

(3 competitors). For the best two-year-old coaching gelding, £5. ——, bay, s. Young Prince, d. by Sportsman, J. Booth, Killerby, Catterick, bred by him.

(6 competitors.) For the best two-year-old coaching filly, £5. Belle of the Leven, bay, s. Cleveland Lad, d. by Master George, J. Robinson, Rudby, Yarm, bred by him.

(5 competitors.) For the best three-year-old hackney gelding or filly, £5. ——, chesnut gelding, s. Robin Hood, d. by Confederate, B. Swaffield, Chatsworth, Bakewell, bred by S. Denham.

(4 competitors.) For the best hackney gelding or mare, not less than four years old, nor exceeding six, £5. Trab, chesnut, s. Ratan, d. by Fireaway, J. Booth, Killerby, Catterick, bred by him.

(3 competitors). For the best pair of horses of either sex. for agricultural purposes, worked during the season, £5, Horse, nutmeg, f. 1842; mare, nutmeg, f. 1843; H. Grantham, Scawby, Brigg, bred by him.

(5 competitors.) For the best four-year-old hunting colt or filly, £5, ——, grey, s. Young Saddler, F. W. Tyas, Norton Priory, Doncaster, bred by him; second ditto, £2 10s., Sir David, chesnut, s. Comus, W. Wood, Bank, Lichfield, bred by Mr. Sykes, 2.

(4 competitors.) For the best four-year-old mare or gelding, of the heavy coach er van-horse breed, £5, bay mare, s. Catfosa, d. by Dart, H. Owston, Killerby Grange, Scarborough, bred by Mr. Woodcock; second ditto, £2 10s., ——, grey, R. Booker, jun., Norton, Sheffield, 2.

(7 competitors). For the best two open Gilts of the small breed, not less than six or more than twelve months old, £5; second ditto, £2 10s.; —— birth Dec. 11th, 1851, Samuel Wiley, Brandsby, York.

Extra Stock Horses (8 competitors). Birdcatcher, brown hunting gelding, R. J. Bentley, Eastwood House, bred by him, 1; grey draught filly, Chas. Timm, Scrooby House, Bawtry, bred by him, 2.

POULTRY.

(5 competitors). For the best Spanish cock and two hens, £1; second ditto, 10s. J. M. Thompson, Dewsbury, 1; R. J. Bentley, Rotherham, 2.

(2 competitors). For the best Spanish cock and one hen, Robert J. Bentley, Eastwood House, Rotherham.

(6 competitors). For the best Dorking cock and two hens, £1; second ditto, 10s. S. W. Lawley, Escrick Rectory, York, 1; T. T. Parker, Sutton Grange, St. Helens, 2.

(4 competitors). For the best Dorking cock and one hen, 10s. T. T. Parker, Sutton Grange, St, Helens.

(19 competitors). For the best Cochin China cock and two hens, £1; second ditto, 10s. Thomas Sturgeon, Manor House, 1; Mrs. Hoggard, Clifton, York, 2; John Hill Smith, Skelton Grange, York, 3. (Two second prizes on account of extra merit.)

(4 competitors). For the best Cochin China cock and one hen, 10s. T. T. Parker, Sutton Grange.

(5 competitors). For the best Malay cock and two hens, £1; second ditto, 10s. Matthew Redgway, Dewsbury, 1; James Dixon, Westbrook Place, Halifax, 2.

For the best Malay cock, and one hen, 10s. James Dixon, Bradford.

(6 competitors). For the best game cock and two hens, £1; second ditto, 10s. Edward Frith, Turner Wood, Worksop, 1; John Hall, Kiveton Park, Worksop, 2.

(3 competitors). For the best game cock and one hen, 10s. John Hall, Kiveton Park, Worksop.

(6 competitors). For the best golden pheasant cock and two hens, £1; second ditto, 10s. Joseph Tuley, Matchless House, Keighley, 1; G. E. Taylor, Oatlands, Leeds, 2.

(2 competitors). For the best golden pheasant cock and one hen, 10s. Thomas John Mould, Belper.

(10 competitors). For the best silver pheasant cock and two hens, £1; second ditto, 10s. Dan Leeming, Halifax, 1; G. E. Taylor, Oatlands, Leeds, 2.

(6 competitors). For the best chitteprat or Corsican cock

and two hens, £1; second ditto, 10s. G. E. Taylor, Oatlands, Leeds, 1 and 2.

(2 competitors). For the best Poland fowl (any variety) cock and one hen, 10s. C. J. Mould, Belper.

(7 competitors). For the best cock and two hens of any other distinct breed, £1; second ditto, 10s. John Hall, Kiveton Park, Worksop, 1; Fenton Bright, Crooke's Wood, Sheffield, 2.

For the best cock and one hen of any other dis- tinct breed, 10s. R. J. Bentley, Eastwood House, Rotherham.

(3 competitors). For the best gold or silver laced Bantam cock and two hens, £1; second ditto, 10s. Charles Smith, Caistor, 2.

(12 competitors). For the best cock and two hens, black, white, or any other variety of Bantams, £1; second ditto, 10s. G. E. Taylor, Leeds, 1; James Dixon, Bradford, 2.

(6 competitors). For the best gander and one goose, £1; second ditto, 10s. Fergus Ferguson, Walkington, Beverley, 1; T. T. Parker, Sutton Grange, St. Helens, extra first prize on account of merit; T. T. Parker, 2.

(17 competitors). For the best drake and two ducks, £1; second ditto, 10s. Robert J. Bentley, Eastwood House, Rotherham, 1; Samuel Watkins, Worksop, 2; James Dickson, Bradford, 2; ditto, 2. (Three second prizes on account of extra merit.)

(2 competitors). For the best turkey cock and one hen, £1; second ditto, 10s. B. H. Brooksbank, Rotherham; R. J. Bentley, Rotherham, 2.

PIGEONS.

For the best pair of blue carriers, 5s. Godfrey Wentworth, Woolley Park, Wakefield.

For the best pair of yellow horsemen, 5s. John Clark' Sowerby, Thirsk.

For the best pair of brown speckled Jacobins, 5s. Godfrey Wentworth, Woolley Park.

For the best pair of runts, 5s. R. Miller, Worksop.

RABBITS.

(3 competitors). For the best pair of lop eared rabbits, 5s.; second ditto, 3s. Charles Smith, Caistor, 1 and 2.

At ten o'clock on Wednesday morning the Council met at the Council Hall. Sir J. V. B. Johnstone, Bart., M.P., in the absence of Earl Fitzwilliam, took the chair. The Council sat till 12 o'clock. It appointed York as the place for next year's meeting. Ripon was a powerful competitor; but it appears to have been an understood rule that, after a meeting in each of the three ridings, the meeting of the fourth year should be held in York.

When the business of the council terminated, the annual meeting was held, and the following were elected as the officers for the ensuing year:—President, Lord Hotham; vice-presidents, Earl Fitzwilliam, Lord Londesborough, the Duke of Leeds, the Earl of Effingham, and Sir T. Legard, Bart.; Council, Lord Wenlock; John Booth, H. Briggs, J. W. Childers, H. Cholmeley, Ralph Creyke, M. J. Ellison, John Hall, H. Hinde, John Hulton, G. Legard, W. Lister, C. Harland, G. L. Fox, W. E. M. Milner, M.P., Jas. Watson, J. Outhwaite, J. Pulleine, W. Rutson, R. F. Shawe, G. Stanhope, W. R. C. Stansfield, M.P., Col. Thompson, H. S. Thompson, S. Wiley, B. Wood, G. Wentworth, R. Denison, G. Swan, and J. G. Smyth, M.P., Esqrs.; stewards, A. Maynard, T. C. Johnson, and H. Clarke, Esqrs.

A resolution was passed acknowledging in handsome terms the services of the local committee, to which Wilson Overende returned thanks. He said the local committee had had much gratification in exerting themselves to make the show successful. They had a strong opinion that a two days' show would answer well, and that the second day would add much to the funds of the society. If the Council left the local committee under the impression that they had done their duty, and had rendered some service to agriculture, they should be delighted. .... S. Stanhope, Esq., moved, and W. R. C. Stansfield, Esq., M.P., then seconded a vote of thanks to Mr. Bright for his handsome present. The resolution was carried by acclamation. Upon the council table were exhibited for the inspection of the members several curious knives, manufactured by Mr. Abm. Amory, of Bernard-street, Sheffield Park. One of them was cruciform, having six branches and 12 blades in each branch—total 72, value £23; another, called the star-knife, had eight branches and 14 blades in each—total 112, value £35; the third was the musical knife, having 244 blades, value 40 guineas; and the fourth had 10 branches, with 20 blades in each, and pillar containing 34 others—total 234, and of the value of 60 guineas. The four knives contain 662 blades and articles, of which 454 are capable of being used.

THE COUNCIL DINNER.

On Wednesday evening, the Council dinner took place in the Cutlers' Hall, provided in very good style by Mr. Wilkinson, of the Angel Inn. About 300 gentlemen sat down to dinner under the presidency of the Earl of Effingham, and vice-presidency of Sir J. V. B. Johnstone, Bart., M.P.

The cloth having been removed, the Rev. Canon Trevor gave thanks.

The CHAIRMAN: In consequence of the absence of Earl Fitzwilliam, the Chairman of the Society for the year, I have been unavoidably called upon to take the chair on this occasion. It therefore devolves upon me to propose the only toast which it is usual to give from the chair on these occasions. You are assembled not to make speeches and drink complimentary toasts, but to enter on a discussion, which I hope will be of a very interesting character to the agricultural community of this neighbourhood. I deeply regret, as I am sure you all will, Lord Fitzwilliam's absence; but I understand he has been unavoidably detained in Northamptonshire by urgent business. I therefore give you a toast never omitted among Englishmen, and which I am sure will be received by you with the utmost loyalty (Hear, hear)—"The Queen, Prince Albert, Alfred Prince of Wales, and the rest of the Royal Family" (loud cheers).

The Earl of CARLISLE was received with enthusiastic cheers. Sir John Johnstone and Gentlemen: By the order of the Council I also rise to propose a toast, and I certainly shall not forget the laws and limitations which regulate the proceedings of this evening; for you are all aware, gentlemen, that our business to-night is to be practical and not oratorical. Nevertheless, having paid our customary and willing tribute of respect to the throne, I am sure you will also feel that a demonstration of respect would be gracefully paid to the President of the day (cheers). Indeed it would seem to follow in natural sequence, for I observed this afternoon, in taking a walk in the beautiful park lately opened near this town, the following inscription—"God bless the Queen and the Howards" (Hear, hear). But though certainly I am not the person to make any objection to that sentiment, still I do not now ask you to join me in drinking this toast because the no-

ble object of it is a Howard. I do not propose it as eminently entitled to your respect because he is my kinsman or at present my host, but because he is, as all who know him will concur with me in saying, full of those manly, gentle, upright, and accomplished qualities which befit an English nobleman —or, to use a higher appellation, a Christian gentleman (cheers). Therefore I feel no doubt that you will worthily follow up the very successful and meritorious exhibition of this morning by now drinking with right good will the health of the President of the evening, "The Earl of Effingham" (loud cheers; and on the call of Mr. Vincent Corbett, the toast was drunk with three times three).

The CHAIRMAN: It now becomes my duty to offer you my best and most sincere thanks for the honour you have done me in drinking my health. I have to thank the noble lord for the kind and handsome terms in which he proposed it, and you for the manner in which you received it. I assure you I deeply regret, for your sakes and his own, that Lord Fitzwilliam has not been present, because he would have filled the duties of the chair much more efficiently than I can ("No, no"). Fortunately for me, the duties are not of a very onerous character; and I am quite sure, with your assistance, I shall be able to get through the evening. Before we proceed to the business of the meeting, by calling on the gentleman who is to open the discussion, I must express the great gratification I have had in being present in the show-yard, as well as taking part in the business proceedings of the day. Unfortunately for me, I have never been able to attend any previous meeting of the Yorkshire Agricultural Society; but I am informed by those who have been present in former years, that the one today, compared with many of late years, has been of a very superior character—that the stock shown has been of a very creditable kind, and in every respect the show has been satisfactory to the members and the public. I believe the society is much indebted to the local committee (Hear, hear) for the pains they have taken in providing accommodation for the stock, and making all necessary arrangements. I think it right to allude to one further subject in connexion with Sheffield, which ought not to be passed over in silence. I have been informed that a gentleman connected with the trade of the town, has had the public spirit and generosity to place at the disposal of the Council a very handsome clock, to be given to that candidate to whom the Council may think fit to award it, in addition to the prizes of the society. The gentleman to whom I allude is well known to most present—Mr. Bright, jeweller; and I am quite sure we are all duly sensible of the spirit of kindness which has actuated him on this occasion. Without trespassing further on your time by any remarks of my own, I shall proceed to call upon Mr. Outhwaite to open the discussion (cheers).

JOHN OUTHWAITE, Esq., of Bainesse, near Richmond, then opened the discussion—on the best and most economical method of cutting and harvesting corn. He had long looked forward to the discussion of this subject, which was of much importance, as he was aware that for a considerable period the question as to which was the best mode of growing good crops had been agitated in the agricultural districts. And when he mentioned good crops, of course he implied that without proper care in the harvest, good crops could not be adequately realized. In his opinion, a great portion of the grain of England was very badly harvested. He would proceed to explain how he and other farmers in his district had been in the habit of harvesting. Many experiments had been made as to the proper state in which wheat should be got in. He had never yet seen an instance of grain got before it was fully ripe that did not furnish a superior sample to that which was gathered at a later period. In his opinion, the great bulk of the wheat between here and York was now ready to cut, but proper care must be taken of it afterwards. As to the reaping by scythe or hook, there was much difference of opinion, but not in cost. Within the last twelve months reaping machines had been introduced, but they were not yet so fully understood as to be condemned or appreciated. He had long been of opinion that reaping might be done by machinery, and he witnessed the first experiment in this country with an American machine, on Mr. Mechi's farm. At that time considerable bias existed against those machines, which might be accounted for to some extent by the fact, that on the occasion he referred to, the machine was sent down in the charge of a policeman. Hussey's machine was set to work by a London policeman, who set it to cut two feet instead of a few inches from the ground (laughter). Under such circumstances it was condemned, and justly so. M'Cormick's machine was next tried, and worked well considering it was a rainy day and the wheat not in a fit state for cutting. M'Cormick's got all the credit because it did the work better than Hussey's, but when tested together Hussey's gained the victory. He had seen another of Hussey's tried at the Barnard Castle meeting, and it worked well. He thought reaping machines had not yet done great service, but he had no doubt that they might cut a considerable portion of the corn in this country. With regard to the practice of using the scythe, there were some objections. In the first place he thought there was some question as to whether that mode of cutting wheat was more economical than that of having it reaped by Irish or English labourers. Again, when corn is cut with the scythe, many of the heads are likely to get at the foot end of the sheaves, and when they come to be planted on the ground, if the ground be damp, they will probably suffer some injury. For these reasons he certainly did recommend, where labourers could be secured at a reasonable cost, the practice of reaping by the hook in preference to the scythe; and he had acted upon the plan himself for the most part, for he had reaped by the scythe but a very small portion of his corn. (Hear). Two years ago a discussion had taken place at Northallerton, in the North-Riding of this county, respecting the reaping of corn; and on that occasion, as on most others, there was a great diversity of opinion, some parties advocating the superiority of the practice of mowing the corn, and others thinking with himself that shearing was the better plan. One gentleman present undertook to send four men over to teach his people how to carry out effectively the plan of reaping by the scythe; and he did not behave illiberally towards them or send them home, saying that he did not approve of their work; but he had been in the habit of using the hook for many years, and the result of his experience was such as to induce him to adopt the opinions which he had now stated. He was well aware that gentlemen who had not seen his mode of operation might condemn it; but much depended upon the state the corn was in when cut. If it were cut and bound up and thoroughly dried, by placing in an opposite position two shocks upon eight, in the shape of a hood—when properly done in this way, he had found that the eight sheaves at all events might be made as safe in the stook, with regard to experiencing any harm from the weather, as if they were carted and safely lodged in the stack. He was not the only farmer in the neighbourhood in which he resided who adopted this plan, because it was practised by nineteen out of every twenty, and for this among other reasons, that it admits the sun and air, and so dries and ripens the corn quicker and better. Another point to which he might advert was, that as long as ever there was any saccharine matter left in the straw, it would feed the grain;

and therefore, if he considered that the grain was drawing any advantage from the straw in this respect, he would allow it to stand in stook, because he had no fear of any sort of rainy seasons—no weather could have any effect upon the corn, when treated as he had described. If they placed the hood with the head upwards, the heads of the corn would hold water; but this objection, by the plan he adopted, was obviated, as he placed the sheaves forming the hood with the heads downwards, and thus the water ran out. He was not aware that he could add anything more, advantageously, upon the subject, and he should therefore now be glad to listen to some of the gentlemen present who might be able to impart more or less practical knowledge, for the benefit of himself and others. (Applause).

Mr. DYSON, of Tinsley, said there was no doubt great difference of opinion among farmers with regard to the proper time for cutting the corn. His opinion was, that when they went round and examined their corn, by taking it between the finger and thumb, and squeezing it, if they found that there was no milk left in it, then that corn was ready, and in the best possible condition for cutting. (Hear, hear.) There was no doubt, he thought, that when corn was in this state, it was far better cut than being allowed to remain upon the ground; and when it was cut, he agreed with Mr. Outhwaite as to the propriety of adopting the plan of hood, because they did not want the corn to be dried in one day, by a hot sun, but to receive the benefit to be derived from the nurture still left in the straw. But the proper time for cutting he considered to be a question of great importance, and he would mention one or two reasons why he thought the plan which he had described a good one. In the first place, if they cut their corn at the time he had recommended, they prevented considerable loss consequent upon the grain shaking; because, if a high wind came, when the corn was nearly ripe and yet uncut, they all knew that great loss was experienced. And another consideration of moment was, that if the corn were cut as he proposed, they would find that it would stand ten times as much bad weather in the stook as it would if cut before it was ripe; it was not near so liable to sprout. (Hear, hear.)

The CHAIRMAN said he had been requested to call upon Mr. Brown, of Wrangbrook, to state his experience of one of the reaping machines, which he understood he had recently had in use.

Mr. BROWN immediately rose amidst cheers. He said he commenced reaping a field of oats with the reaping machine a few days ago. Some part of the crop was laid, and with that they had some difficulty, but they experienced none whatever with that part that was standing. Some parties present were very much dissatisfied with the performance. On the day following he commenced an eighteen acre field of wheat. ("Was it Hussey's or M'Cormick's machine?") It was Hussey's machine, made by Crosskill. On the first day a number of spectators crowded round and annoyed them a good deal, but on the second day they had a fair opportunity. It was a large field, and all the crop was standing, The whole eighteen acres was reaped in two days. They experienced no difficulty whatever in the operation, and it was done quite as well as it had been done with the scythe, and rather better. However, he was not at all sanguine about the capabilities of the machine to reap laid corn. He had only had his machine about a week, and he had not tried it with laid corn, and he could not say therefore how far it might succeed with the laid crop. But as to standing wheat, however heavy the crop, he was satisfied they would be able to do it in a very workmanlike manner. Mr. Brown then commented on Mr. Outhwaite's plan of leaving the corn a long time out in the shock. In his opinion to leave it out in the fields five or six weeks was to run a great risk (Hear, hear). Recurring to the capabilities of the reaping machine, he observed that when a crop was cut in a workmanlike manner by the machine, he preferred it either to the work of the scythe or sickle. For standing corn, he had no doubt the machine would come into very general use; but as to its capabilities of reaping laid corn he was unable to give an opinion. In the first instance, they commenced gathering the sheaves with a rake; but at the suggestion of a friend, her adopted a different plan. One of the men who was clever at the operation, put the corn off the machine with great regularity in the form of sheaves, without bands, and eight men followed, who made the bands and bound up the sheaves. That, he thought, was preferable to using the rake at all. It was necessary to have two clever men to manage the reaper, and eight other men to follow (murmurs). He had no doubt that with such a force as that, they could reap eight acres a-day comfortably ("With how many horses?"). At first they geared two horses, but the weather being very hot a third was added, and a boy was engaged to lead the first horse. That was found much easier. They worked the horses about two hours, and then replaced them by fresh ones. The work would have been much easier but for the hot weather ("What is the average cost per acre?"). He had not calculated the cost, but he was quite certain it was less per acre than if reaped by sickle or scythe. Any other questions he would be glad to answer ("What would you do with the labourers?") Mr. Brown was asked if he had seen M'Cormick's machine at work, and he replied he had not.

Mr. H. DYSON (Tinsley): Are not the heads of the corn likely to get into the butt-end of the sheaf?

Mr. BROWN: Perhaps more than with the hook, but decidedly less than with the scythe.

Captain R. F. SHAW (Brantingham) asked Mr. Brown if he did not find that the working of the machine galled the necks of the horses? He had used Garrett's machine, and he found that the great weight of the machine rested on the necks of the horses, and consequently injured them. It occurred to him at the time that it was possible to affix a small wheel in the forepart of the machine, at the point where the man with the rake sat, and thus take off the pressure from the horses' necks. He begged to ask Mr. Brown whether he had not noticed the same fault.

Mr. BROWN remarked that the machine required the exercise of a little patience in its management. As to galling the horses, they found on the first day some little difficulty, but that arose from putting on the links of the pole in the wrong place. They removed them about a foot nearer to the pole end, and that remedied the difficulty; and by changing the horses about every two hours they were not at all distressed.

Captain SHAW considered some improvement was necessary in that respect. His experience of Garrett's machine had shown him that it was a little defective in speed. Instead of going at the rate of two miles an hour, they were obliged to drive at the rate of three miles an hour in order to do the work properly; and whenever they came in contact with laid corn the machine immediately choked. He had seen Crosskill's machine at work, and had observed the galling of the horses' shoulders the same as with Garrett's machine. The two were of course very similar. The chief difference was in the knives. In Garrett's machine, the knives were made sharp on one side, like scissors, and pointed at the end, while those of M'Cormick's were square cut at the ends, and sharp on both sides. He agreed with Mr. Brown that the reaping machine was likely to become a most useful implement.

Mr. BROWN asked Captain Shaw if he had noticed whether

the work was hardest for the horses when the corn was ripe or when it was unripe?

Captain SHAW: I have cut both wheat and oats with the machine. They were rather ripe than otherwise: not dead ripe, but yet not green. There were at least five quarters of wheat to the acre, and it was very long in the straw. The machine did its work very well after the first few runs.

Mr. BROWN: If you try three horses, with a boy to lead in front, you will get on much better. They will go much steadier.

Captain SHAW: Oh, we use very good powerful horses, and well fed.

Mr. BEAUMONT inquired what was the advantage obtained in employing the reaper? Was it in time, in money, or in both? According to the statement of Mr. Brown, ten men and one boy were required to conduct the reaping operations. In the district where he (Mr. Beaumont) farmed, viz., in the neighbourhood of Barnsley, the men who were employed to harvest received 5s. a day, and boys 1s. Therefore, to have ten men and a boy, and the expense of horses, he had calculated would amount to 63s.; and if the reaper cut eight acres per day, the cost would amount to nearly 8s. an acre, which was 3s. an acre more than under the present system in his district.

Mr. BROWN said he was decidedly of opinion that they could reap more with the same hands with the reaper than without it, and for less expense. Second-rate hands would do for gathering the corn, and they might pay a man, say 2s. a day for gathering corn, whereas by mowing corn they would have to pay 3s. 6d. or 4s. a day, and this showed the benefit of the reaper.

Mr. H. S. THOMPSON, of Moat Hall, said that not having tried this machine, he should have preferred leaving the discussion to those who had done so. It had been tried by few people as yet; but he was inclined to offer a few remarks from having witnessed nearly all the public trials that have taken place with the reaping machine in this country. He had had the honour of being a juror, and had had the opportunity of examining the implement. He saw Hussey's and M'Cormick's machines tried last year in Cleveland. He also saw them tried at Barnard Castle, and lately at Lewes, where there were 15 or 16 of these machines at work. The great difference in the two principles by which these machines are distinguished, is in the form of the knives. The form of M'Cormick's knives had been altered since the machine had been brought over to this country, and Messrs. Garrett had improved upon the principle adopted by Hussey; and of the 15 or 16 at work, to his mind, Garrett's improved knife made by far the best work. The appearance of the corn cut by M'Cormick's machine was likewise equal in appearance to that cut with the sickle. It was suggested at Lewes that a wheel should be put in front to relieve the stress upon the horses, and he had no doubt that before long such an improved machine would be brought out. Howard's machine contained another improvement in laying the straw down the best in cutting; it, however, did not work well, and it seemed to require great alteration before it would so. Before the arrival of another year, he had no doubt they would have a machine brought out in a much more perfect form than they had now. The only thing the machine could not do at all was the laid corn. If the corn was laid one way, and not quite on the ground, the machine would cut it very fairly, so much so, that he should have no hesitation in cutting in that way. He thought it was worth while to draw their attention to the point of laid corn, and conceived there was a great deal to be done in that respect. Was there any possibility of diminishing the quantity of laid corn? He thought there was. In going through the country, and seeing two fields side by side, one standing and another quite flat, there was a cause for it, although the cultivation might be pretty nearly the same. He believed the great difference would be found in the kind of manure which was supplied. This year we have had a very warm season, and in many parts of England a good deal of rain had fallen when the corn was filling. Speaking of his own district, and the district of Lincolnshire, in which he had travelled during the last few weeks, he had found that the quality of the corn had been deteriorated very much within the last three weeks by mildew, &c., which, of course, made the sample worse and the yield less. During the last few years there had been an increase of the guano brought into use. If they applied guano in large quantities, without altering the cultivation in other respects, in such a season as this they might do a great deal of injury. In the one case they might get a moderate crop of good quality, and the straw is bright and fine; whereas, with two or three cwt. of guano, the crop looks extremely promising till the last few weeks; but when the showers come, the warm moist weather causes the mildew and other diseases, and the farmer who has spent £1 or 30s. per acre, would be very glad to exchange with his neighbour who has used none. He alluded to an experiment which had been made, and he thought that the standing of corn had a great deal to do with deep cultivation and exposure of the soil to the air, and that the deeper and the more perfect the cultivation of the soil the better (applause).

Mr. MAW, of Tetley, Lincolnshire, in reference to the observations of Mr. Shaw, said that if the chains of the pole were wrongly adjusted, then as a matter of course the shoulder would be much shaken, and the legs injuriously jarred. With regard to the deep tillage recommended by Mr. Thompson, he had himself always been an advocate of that system, upon the principle that the deeper the tillage the more room would there be for the extension of the roots and the strengthening and improving of the crops. As to the culture by guano, he had himself manured his wheat by fold-yard manure, whilst a near neighbour used guano. At first the guano-manured wheat looked very much best. It looked glossy and black in the spring; but this premature luxuriance affected the crop when approaching maturity, and at the present time the wheat grown by farm-yard manure was better than that upon which guano had been used. Mr. Maw concluded by saying that although guano stimulated the soil at first, and brought out the farm-yard manure which had lain dormant in the land, yet it after a time proved exhaustive to the soil (applause).

Mr. WHITE, (Professor of Chemistry, of Bow, near London,) said he should not have ventured to intrude upon them at that hour of the evening, if subjects in which he felt very deep interest had not been called into discussion. Mr. Thompson had referred to the employment of guano, and had stated the manner in which an excess of ammonia had been given to crops by the employment of that manure. He (Mr. White) would merely venture to state some extraordinary facts, to which they would perhaps hardly give credence, but which he could assure them were true; and from which they could draw their own deductions. Considerable attention had recently been directed to the great question of the manure to be obtained from the sewage water of large towns; and he had been lately engaged in prosecuting a number of experiments, in the employment of sewage water in fine washed sand; and by the employment of it, under proper regulations, they need not fear for any results that might arise injurious to the crop of grain. However, he would state the facts, and leave them to draw their own deductions. By proper regulations, they might obtain straw equal, if not supe-

rior, to any that has been imported from the highly favoured country of Tuscany. From this lightly washed sand he had produced a quantity of straw which he had exhibited to gentlemen at the Royal Agricultural Society, at Lewes ; and he was now prepared to show an extraordinary fact. When the sewage water had been precipitated and separated from the grosser matter by the application of chemical agents, it became simple and almost inoffensive to taste or smell. The sewage water, after being exposed to the action of the powder, presented no appearance perceptibly different from common water. Upon analyzing it, however, he found that 260 tons of it contained as much—Peruvian guano they might term it, if they would, but he called it British guano—contained as much British guano as there was in three cwt. of real Peruvian guano ; and it contained every element of it, and in the best state for assimilation with the land. This was an extraordinary fact, and in a few weeks would be verified by the production of the grain upon the table of the Royal Agricultural Society, in Hanover-square. He merely mentioned this fact that they might make some further investigation into the subject.

Mr. PETER LOVE, of Northamptonshire, after expressing his gratification at the manner in which the discussion had already been conducted, said he thought that considerable attention should be paid to any subject connected with agriculture before any district or portion of the country should dictate to another any system the result of their own experience only. He first acquired his experience in the west of Scotland, where he had a very wet climate to contend with. He next removed to Ireland, which was a better climate; and afterwards to the west of England, which was a better climate still. When he came to Northamptonshire, he was surprised to find farmers cutting their crops of wheat, oats, and barley with the scythe, which he thought a very careless method. But in two or three years he found that they could carry to market a better crop than he could. In no part of the world were men more careful in harvesting their crops than in the north of England. He thought it was best to grow as little green produce amongst corn as possible, so that after it had been cut it might be put quickly into a safe position. He recommended all persons to pay great attention to the nature of the climate in which they cultivated land; and that when farmers removed from one part of the country to another, they should ascertain as quickly as possible the average quantity of rain that fell in each year. They would then be able to form an opinion whether the apparently slovenly system of harvesting corn, adopted in the south, or the more careful system of the north, would be most profitable to them. In the wet climate of the west of Ireland, he found that corn was never cut till it was dry, and it was stacked immediately, for they would run no risk by letting it lie on the ground. It was stacked in small stacks; and though the rain wet the stack externally, the high winds dried the stack inwards. He thought at first that this was a very queer method, but he afterwards saw that there was much philosophy in it. If men would but study the customs of a locality, they would often come to the same conclusion; for they might often find a "wrinkle" in the worst localities. There was yet one other vexed question connected with the harvesting of corn which had not yet been touched upon, and that was as to the best vehicles in which it should be carried from the field to the stack-yard. Some were in favour of carts, others of waggons. He had always been a one-horse cart man; but he had seen work done so well by waggons, that he should be much puzzled to which method to give the preference. He recommended persons who might remove into a district h re waggons were in general use to adopt that method, because the predilection of the labourers would be in favour of that system, and they might think it up hill work instructing them in the other method. Improvements should always be made steadily. Another subject was as to the best mode of stacking corn. Some persons were in the habit of making their stacks wide and low; others high and narrow. He thought both systems objectionable. A high stack consumed labour in getting the corn to the top of it. A wide stack required more thatching, occupied greater space, and required more straddles. He thought it best to make stacks of a medium height and width, and nearly perpendicular.

The CHAIRMAN: It is thought that the discussion should now be closed. I beg on behalf of the society to thank those gentlemen who have taken part in it, for the valuable information they have given us. Gentlemen, I will give you the closing toast of the evening, "May we have a fine day tomorrow" (loud cheers).

The meeting broke up at twenty minutes to ten o'clock.

The prize given by Mr. Bright, which was to be assigned to the most deserving exhibiter, was awarded to Charles Towneley, Esq., of Towneley Park, his three year old cow and calf, in class 5, being thought by the judges to be the best animals in the show-yard, and he having also obtained the greatest number of first prizes.

COTTAGE GARDENING IN CORNWALL.—The season being advanced so far enables a person to see a little of the summer's arrangements as displayed in the cottage gardens. In many of them near this we see a number of tender plants that have stood the winter in the open ground without any protection, and these are now more or less in a flowering state. In many instances, I see scarlet geraniums growing against the wall of the cottages—some of the tall-growing sorts, and these are flowering beautifully, beside myrtle trees trained to the walls. Myrtles grow very freely in this neighbourhood without any protection, and generally flower profusely. Many have them trained up the fronts of their cottages, with and without any other plants amongst them, according to the pleasure and taste of the occupier. In a few I see some of the more choice geraniums—of those sorts that are always so gay and attractive—when well grown, and as they invariably are seen on the stages of the exhibition tents at the Botanic Gardens, Regent's Park. In the cottage gardens about Penryn and Falmouth many of these are now flowering where they have been in the ground all winter. Of course, they are rather unsightly in shape ; but these things are not so easily managed when remaining in the open garden all winter ; and, again, such is of far less consequence. The half-shrubby calceolaria stands the winters here in ordinary cases; but these do not seem to have found their way so generally into the cottagers' gardens as the geraniums. I may just remark I have had five ordinary-sized flower beds of Caie's Calceolaria, besides many single plants in borders that stood last winter, and have for six weeks now past given a great abundance of flowers. There are two Veronicas that seem to succeed very well in the cottage gardens—namely, V. Lindlyana and V. speciosa. They are both very pretty and gay during the latter part of the summer.

After they are established a few years, they do not grow so long-jointed as they are liable to do in their early progress. I do not see much of the bedding-out system amongst cottagers here: many things tend to check this fancy, as they term it. In the first place, there is no nursery sufficiently near where any of these little plants could be procured; and, in the second place, they are all attached to the mixed-bed system —that is, herbaceous plants, annuals, and others, all mixed together in their beds and borders. I am by no means sure if this arrangement does not give the best nosegay effect. Where a little is always expected, many of the older and common varieties of Fuchsia grow very freely. I know of some places where the Fuchsia is grown as a hedge, and it certainly looks gay, and has a very pretty effect all the summer and autumn up to the chilly nights of winter before the last of its flowers drop.—G. Dawson, *Enys*.

"WHERE THERE'S *MUCK*, THERE'S MONEY."

HINTS IN AID OF AGRICULTURE, FOR THE USE OF FARMERS.—MANURES: SUGGESTIONS RELATIVE TO BRITISH FERTILIZERS.

BY A PRACTICAL FARMER.

We have often thought a few words on these subjects might be useful in stimulating our farming readers to renewed care and effort in making and economizing, and in the application of the manures of the farm. We need not take up the space allotted us to point out the many ways in which these matters are neglected in farm practice. We at once assert that gross negligence in the making or *manufacture* of manure is all but universal amongst the generality of farmers. We also assert that the absence of all mode for economizing or for the preservation of farmer's manure is not only very reprehensible, but its management is of the most careless and wasteful character; and also that the application thereof very often betrays great ignorance of the requirements of the crop and soil.

Hints on Fold-yard Manure.—The farmer's great resource is in his fold-yard manure: it is as the mainstay to the mast, or the sheet-anchor to the ship. No department of his business will pay him better than his manure-manufactory (if we may call it a manufacture)—his composition of manure. His attention ought constantly to be engaged in adding to its quantity and virtues. Every particle of vegetable matter produced on the farm, and not being required for consumption in the fields, ought to be brought to the fold-yard, there to be converted into manure—all ditch-roadings, hedgerow-weedings, and leaves, stubble, twitch, and other roots of weeds, fern, heaths, rushes, &c., &c. To these add sea-weed and shell-fish—kelp and mussels, cockles; also fish of unsaleable kinds. These to be mingled or strewn about the yards, as the process of making goes on by the cattle, with which the yards and hovels ought to be filled to overflowing, and which ought to be good fattening animals, not poor lean stock; and every portion of the fodder should be supplied them in conjunction with turnips, mangolds, and other roots, together with corn, cake, meal, or other artificial aids, to promote condition in the manure-makers. Whilst this is proceeding, great care should be taken that the accumulating hoard should not be too much saturated with rain-water, nor the liquid manure be permitted to flow away, but that all such drainings should be regularly thrown over the whole heap or collection of materials; and the yards should be sufficiently commodious to contain the whole, and retain it complete and compact in one thickening mass, without suffering loss of ammonia or unnecessary decomposition by removing or upturning till required, or nearly so, for use. Thus it ought to lie. To prepare it for most effective and useful service is but the work of three or four weeks, at most, if it is properly made, and the ingredients are rich. All that is required is to turn it over, and well mix all together, about three weeks prior to its being used. This will promote a very rapid fermentation; and at its highest point of fermentation, and when possessing or giving out the most ammonia, it should be applied to the land, and ploughed the very same hour in which it is laid on.

Hints on Farmers' Compost Manures.—The farmer may also very advantageously make or manufacture good and effective compost-manures, of a homely character, but of a highly fertilizing nature. He should invariably in every winter season collect a sufficiency of night-soil for his use in the succeeding summer; he should carefully preserve the manure from his piggeries, his dove-cote, and his poultry-house; these mixed with three-fourths more of good loam make an exceedingly good fertilising compost-manure, and if properly kept over a year all the better; if it is then mixed with good fresh loam or ashes, and drilled along with the turnip-seed, it will form a very forcing aid to the young plant. About fifteen bushels per acre is a good dressing in addition to ashes. Additions might be most beneficially made to this—compound collections such as the following: butchers' refuse, containing the blood, entrails, &c., &c. of the slaughtered animals; dead animals of any kind, for their flesh, &c.; fish of all kinds, tanners' refuse, fellmongers' refuse, tallow-chandlers' grave-cakes, &c.

Hints on the Collection of Night-soil.—The excretions of one person are, upon the average, about seven or eight ounces solid fæces, and of urine three and a half pounds per day, the weight of the latter depending much upon the quantity of liquid drank and the state of the air; but the solid matter will be daily about the same weight. It will average yearly about one and a half hundred-weight solid excrement, and eleven hundred-weight of urine. From tables now before us we find that this matter is more valuable than

rape-cake; and, when mixed with peat-charcoal, is superior to it. It is also about half the value of Peruvian guano. Now nearly one and a half millions of tons, under proper regulations, might be annually collected of this valuable manure; and by adding two parts of peat-charcoal to one of this night-soil, we have an accumulation of manure available for use of four millions five hundred thousand tons, and worth about thirty millions of pounds—and this properly deodorised, and adapted for every service without disagreeable smell or objectionable inconvenience. We suggest this outline of operations: That all towns adopting the sanatory law be imperatively required to provide means for collecting and deodorising the night-soil and sewerage thereof; for this purpose the inhabitants of any town agreeing to accept this law, shall be compelled to adopt such regulations as the Sanatory Board, under careful and proper reports from each town, shall deem right to propose to them. The regulations for the collection and preservation to be left to the local boards of each town, as also the deodorising and preparation for sale, and all the general business and management connected therewith. This local board to view every receptacle or privy, and adopt for every case such provision for carrying out the intentions of the Sanatory Commission as they may deem right, varying of course such provision according to the circumstances of each separate case, and in due consideration of the convenience of residents. We suggest that suitable appliances be attached to every receptacle for the deposit of night-soil or other fertilizing matters, and that regulations be adopted to compel the construction of others, where such appliances cannot be made available; that the servants of the local boards should be provided with proper deodorizers in sufficient quantity, and apparatus suitable for the removal of the contents of each receptacle; that previous to removal the deodorizing preparation be effectually mixed with the materials collected in the receptacle or reservoir, and so soon as the disagreeable smell is gone, proceed at once to remove the whole to the place of general deposit provided by the said board; that into this place or general reservoir should also be thrown all urinary collections, soap-suds, and such-like matters, small putrid substances of whatever kind, and the larger substances of this kind to be first decomposed by sulphuric acid before admixture. That these local boards shall cause the materials so deposited to be prepared in such manner as to them seems best adapted to command a sale; that the proceeds shall be devoted to the payment of costs in execution of the commission, and the balance, if any, to be proportionately divided amongst the inhabitants or parties entitled to receive it as being included in the boundaries of the commission or local board; that for the purpose of properly preparing these materials the local commissioners shall be empowered to purchase powerful filterers and apparatus for filtration, also such ammoniacal admixtures and substances as they may require—the filterers would allow the watery particles to escape or run off, and would leave the useful and most valuable deposit behind, whilst the ammoniacal applications would much enhance the value of the manure; that the most powerful deodorizer as yet discovered is peat charcoal, or charred peats—this might be obtained in any quantity under proper regulations, and at a cost of about sixty shillings per ton. What a large and profitable source for the employment of labour would arise in this preparation! Gypsum, soot, coal-ashes, and burnt clay are also deodorizers, and good fertilizers. As we are giving a few practical suggestions or hints for the use of farmers, may we give one or two for the use of "One of your Old Correspondents." We can assure him that no one sympathizes more keenly with our suffering agriculturists than does A Practical Farmer; and few have been called upon to experience directly and indirectly severer losses from the altered policy of our Government toward us as farmers: still he is not without hope—*he almost lives upon hope.* The sacrifice of agricultural property by the repeal of the corn-laws in 1846 was awfully ruinous; the sole effect of state enaction. *The deplorable deed was done,* and extreme depression has been the result: *the lowest point was touched,* and now we think there is a point at which we might start and prove some profit in a general business as a farmer and grazier, if not farming alone. It is certainly true that one slight change after another is slowly betokening improvement, and we are fain to hope that something better is "looming in the future." Wool first began to realize a fair general average in price sheep soon followed; cattle next took a favourable turn, and other kinds of live stock partook of the same satisfactory change. In farming, as apart from grazing, a better aspect has presented itself: wheat has throughout (excepting 1847) been ruinously low, and much do we regret it on every account. We must, however, look fairly into the case; and for the past two years we find that barley, beans, peas, and oats, have at all events approached—almost touched a remunerative price. We think that "Your Old Correspondent" commenced business in the autumn of 1849 or spring of 1850; he will be able to prove some profit arising from it, and a further profit upon his outlay for farm stock. We do not say he has a very encouraging business, but that it is not altogether unprofitable. A Practical Farmer's business combines the breeding of both cattle and sheep, and also the fattening of them and others purchased for that purpose: his farming embraces a considerable proportion of wheat, potato, and turnip culture; his crops have been favourable, and although he declines producing a "balance-sheet," for many reasons, he would say to "Your Old Correspondent" it is on the right side, and not "all botheration and blarney." Will he suffer, or rather excuse a hint or two? Do not depend too much upon the culture of wheat or even other grain: the whole world are your competitors, under far greater advantages as to costs of culture, and almost on equal terms as respects cost of transit. It is not so in reference to live stock—costs are greater. Adopt then, and determinately, in moderation, the grazing of all the stock your farm can be made to carry, and if your holding is applicable breed all you can; breed or purchase the best kinds, and fatten them after the best practice: grow abundance of the artificial grasses—grow

plenteously of turnips, mangolds, cabbages, and similar food, according to your soil—get all the crops you can, irrespective of system (but look to getting good ones, or let sowing alone), adopt every real improvement in modern practice, and have all carried out with the greatest punctuality and economy; grow the best varieties of grain and of root crops, and put them in and manage them after the best modes, and consume the root crops with other artificial aids, as cake, corn, &c.; you will require this to keep up the fertility needed, for we know no bounds to the productive powers of the soil under judicious care and generous treatment.

THE YORKSHIRE AGRICULTURAL SOCIETY.

HARVESTING CORN.—REAPING MACHINES.

There never was anything more opportune than the discussion of the best mode of harvesting corn at the Sheffield meeting of the Yorkshire Agricultural Society, on Wednesday, Aug. 4; nor could a more careful reaper of his own grain have been selected than Mr. John Outhwaite, of Bainesse. The time is opportune, because we are in the very month of a large, heavy, and difficult-to-secure harvest; and when two or three reaping machines are actually pressing on public attention for favour and encouragement—while a gentleman who takes more pains with his own harvest could not possibly be selected than John Outhwaite, of Bainesse.

How far the reaping machine will one day supersede hand-labour—how far it will enable the farmer to depend on the safety of its well-sharpened knives and the strength of his sturdy horses rather than on the fitful supply of labourers, thinned by emigration or expatriated by competition, or absorbed by government drainage or railroad excavation, is, we must say, a question not yet solved. The Scottish implement, transplanted on transatlantic shores, then made available because no other means of harvest was possible, has come over again across the ocean, and has been improved by our own artizans; and it is not unlikely it may meet with a considerable degree of encouragement. It will cut corn, it will harvest the common ordinary crops capitally; it will do the work—the hard and terrible work of the severest of agricultural tasks; but whether a farmer will do well to depend upon it, with all the tendency of great crops to lodge, and all the liability to heavy rains, is a question which is by no means decided. The struggle, however, for preference between Hussey and M'Cormick is partly absorbed in the question of whether either will for harvesting purposes become generally useful. This depends, however, on the state of the crop, and much time will doubtless be wasted ere ever that question is settled. Thousands of acres will this year, however, give way to the huge leveller; and another harvest will test its economical results.

But it is not with the reapers alone that the struggle of harvest either begins or ends, so long as we see barley treated as hay—mown, tossed, and turned about like hay—spread and re-spread, and exposed to every blast of wind, every bleaching sun, and every discolouring rain. We may contrast this with the harvesting of the north of England; and a great difference will be observed. The stooks or shocks at Bainesse, the farm of the opener of the discussion at Sheffield, are like a thatched stack. The heads which stand upright are all covered; those necessarily exposed are with the heads downward. The sample is fine and fresh, and may remain out for any length of time, or in almost any weather. Nothing can injure it.

The Bainesse shock, of which we give an engraving, is a model of perfection in the preserving of corn after harvest, in our somewhat uncertain climate.

Nor is it in the form of the shock alone that the superiority of this harvesting is chosen. The rows are as straight as a line can draw them, and are as secure from all removal as they are neat and pleasing to the eye. We fancy the farmers of the west of England would do well to imitate at least in some degree the care of their more northern neighbours.

We have been assured by the Gloucestershire maltsters that their barley, with all this exposure, is better than the barley of the north. But this is begging the question. If we have in the north of England a worse climate—if we are more careful over a sample which is inferior—how much more reason there is to make the best of a favourable soil and a genial climate, and preserve that which is so very valuable and so well worth preserving. The bleaching sun in a fine season interferes with the sample. The dying energies of the expiring grain is short in forming bran of the starch of the grain, and so diminishing its power to afford saccharine matter. While the rain, should it come, instead of finding the corn all laid it is standing upright, shedding it off, and soon pierced by the blast in an interval of dryness. The decay and solution of the finer particles is prevented, and the tendency to sprout or turn into malt, prematurely very much diminished. We are not generally in favour of going to the expense of hooding barley. If we can be certain of a fine season (and who can?) the hooding of wheat may be dispensed with; but if there is any doubtful weather the hooding should

A Bainesse hooded Shock or Stook.

not be neglected, and it will amply repay the extra labour bestowed upon it.

The question of the policy of mowing or shearing grain does not now admit of the same limit of reasoning it used to do. The tendency to rapidity in every movement is doing much to do away with shearing corn. The mown corn is much more easily reaped, sooner secured, and will dry better in the stack and the shock. The stubble will also be of use in the fold-yard rather than on the land.

We call attention to the discussion itself for the full particulars of the interesting meeting. Whatever failure there might have been at Lewes, there was none here. There was a large show of implements—the selections of the best from the winning manufacturers of the day. The number of entries of stock exceed both the last years, though they were very promising; while the interest of the show was great beyond precedent.

The reapers were a great source of attraction. The trial was to have been private, at seven in the morning; but a slight shower having taken place, the owner obstinately refused to allow his oats to be cut till noon, when a great crowd attended. The three were Hussey's improved by Deanes, and another improved by Crosskill, and M'Cormick's improved by Burgess and Key. The first named unfortunately broke, owing to some of its screws not being drawn properly up, and on the whole M'Cormick's in that trial did its work the best. Judging of the work before them, and the individual implements, the judges decided in favour of M'Cormick's machine; but it can in no way be considered as a settlement of the *principle* of the two, but only a judgment of the machines before them. The following remarks were made by an eye witness, who had no partial bearing —nor any interest in the trial, and deserves all the attention which an impartial authority can carry.

"The machines were three in number, namely— M'Cormick's, manufactured by Burgess and Key (price 25*l.*); Hussey's, manufactured by Crosskill (price 21*l.*); and Hussey's, manufactured by W. Dray & Co. (price 18*l.*) The machines were to have commenced operations early in the morning, but by some misarrangment the earliest of them (M'Cormick's) did not get to work till eleven o'clock. The crop upon which the machines were brought to operate was a field of oats, about four acres in extent. It was in very fair condition up to this morning, but a shower of rain that began about ten o'clock to some

extent unfitted it for the process of reaping. The three machines were in a short time brought into play on different parts of the ground. M'Cormick's met with some impediments at starting, but its two competitors appeared likely for some time to be overwhelmed with failure. The sceptics with an air of something like triumph, cried 'It can't be done,' and the anticipations of the more hopeful observers were sorely disappointed. No sooner had the two 'Husseys' got what appeared a fair start than the cutting apparatus was choked up with the blades of corn, and the machines came to a dead lock. They had then to be thrown out of gear and freed from the entanglement. The next movement would be suddenly checked by one of the wheels dropping into the furrow and letting the machine down upon the ground. It then trailed along like a flat board, levelling the corn as flat as if it had been rolled—*cutting* it about as much as it would have been cut by the smoothest roller. In this wise the operation went on for some time, till the margins had been cut away, with the aid here and there with the scythe. The machines then began to make better play, and wherever the ground was moderately even, a long but not very broad strip was taken off the margin of the corn with astonishing rapidity. Each pair of horses was kept at a very rapid walk. The chief difficulty now was to rake off the corn as it fell upon the machine. Any considerable accumulation would have arrested the locomotion. The man who stood upon the machine and handled the rake found it necessary to strike the corn with great force in order to get it quickly out of the way; but as the corn had not attained to ripeness it did not suffer by the premature thrashing. It must have been very severe work for the man with the rake, and such as no individual could have sustained for any considerable time without an occasional and not unfrequent 'hitch' to afford him an interval of repose. M'Cormick's machine, while it leaves the stubble too long to suit economical farmers, seems for that very reason to be less liable to impediments. It is armed with a revolving apparatus something like the sails of a windmill, which, closing down upon the corn alternately, press it in a horizontal position upon the machine ready for the cutters, which are in rapid and incessant motion as long as the machine keeps going. It would betray extreme ignorance of the early history of machinery of every kind to take it for granted that these reaping machines have at this stage of their existence arrived at perfection. We believe unhesitatingly that they are capable of and will speedily undergo considerable further improvement. But were that not so, the reaping machine in its present state of development would be destined to play an important part upon most large farms. Where the corn is laid, or the ground is uneven, or where some other special disadvantage of that nature exists, the animated reaper with his scythe or sickle might set the less flexible mechanical reaper completely at defiance; but on every extensive farm there would be some scores of broad acres where the reaping machine would literally carry all before it. This would be the case to a great extent on the Yorkshire wolds, for instance, or on the well-tilled sand-lands of the adjacent county of Nottinghamshire. While speaking of the latter district of cultivation, however, we are reminded of an impediment that might arise there, as well as in many other places, from the growth of rank short grass amongst the corn. This grass would necessarily undergo the operation of cutting simultaneously with the legitimate crop, and would not the effect be to clog the cutting apparatus and occasion frequent stoppages? We are assured by individuals well qualified to form an opinion that this would be the case. But after all, the best criterion of the capabilities of the new mechanical reaper is the fact of the immense number of machines that have been ordered since the invention was brought prominently under notice at the great exhibition of 1851. We understand that some fifteen or sixteen hundred of one kind or another have been manufactured in this country, and at the present moment the makers have far more orders in hand than they can execute within a reasonable time. And we cannot suppose that agriculturists, in these hard times especially, have given their orders at random. They have observed, and no doubt well considered, the obstacles with which the machines have to contend and their capabilities of overcoming them. These difficulties we have frequently pointed out. They must be made perfectly plain before they can be overcome. On the other hand we have taken care not to exaggerate them. The trial of reaping machines at Lewes, two or three weeks ago, we had not the advantage of witnessing; but we are informed by an intelligent practical observer of that trial and the test of to-day, that the two sets of experiments are about on a par in the measure of their success.

The machine that first concluded its performance was M'Cormick's—about one o'clock, having worked about an hour and a half. The irresistible conclusion at which every careful observer must have arrived was that of the three machines this did its work in the most satisfactory manner. Crosskill's machine finished some 20 minutes after M'Cormick's. The other machine (Dray's) was less fortunate in its career than either of its competitors. It sustained a fracture just about half-past one o'clock which for the time disabled it, and in that state it was removed from the ground. In the allotment assigned to Dray's machine there now remained a considerable breadth uncut. Crosskill's machine began and operated upon a portion of the remnant, and it was

finished by M'Cormick's implement, which cut in very good style a rood in eight minutes!

It may not be out of place here to state by way of recapitulation, that the opinion of many practical men, who have been close observers of this experiment is, that the prudent farmer will be disposed to wait awhile till the reaping machines have been tested to a greater extent than there has yet been time for. There are already a sufficient number of reaping machines at work in various parts of the country for all purposes of experimental trial. A great number of intelligent minds are at work searching for defects with a view to devising improvements, and those farmers who defer their orders to the approach of another season will peradventure be able to procure, without any extra cost, an implement much more efficient, and in many ways better, than the best of the present day."

As somewhat of a set off against this, at the discussion on harvesting corn, to which we made allusion in the last week's *Journal*, we may mention a very favourable opinion was given by a practical and skilful man, Mr. Brown of Wrangbrook, who is every day practically testing Hussey's machine on his farm. He said, "He commenced reaping a field of oats with the reaping machine a few days ago. Some part of the crop was laid, and with that they had some difficulty, but they experienced none whatever with that part which was standing. Some parties present were very much dissatisfied with the performance. On the day following he commenced an eighteen-acre field of wheat. It was Hussey's machine, made by Crosskill. On the first day a number of spectators crowded around and annoyed them a good deal, but on the second day they had a fair opportunity. It was a large field, and all the crop was standing. The whole eighteen acres was reaped in two days. They experienced no difficulty whatever in the operation, and it was done quite as well as if it had been done with the scythe, and rather better. However, he was not at all sanguine about the capabilities of the machine to reap laid corn. He had only had his machine about a week, and he had not tried it with laid corn; he could not say therefore how far it would succeed with a laid crop. But as to standing wheat, however heavy the crop, he was satisfied they would be able to do it in a very workmanlike manner. Mr. Brown then commented on Mr. Outhwaite's plan of leaving the corn a long time out in the shock. In his opinion to leave it out in the field five or six weeks was to run a great risk. Recurring to the capabilities of the reaping machine, he observed that when a crop was cut in a workmanlike manner by the machine, he preferred it either to the work of the scythe or sickle. For standing corn he had no doubt the machine would come into very general use, but as to its capabilities of reaping laid corn he was unable to give an opinion. In the first instance they commenced gathering the sheaves with a rake, but at the suggestion of a friend he adopted a different plan. One of the men, who was clever at the operation, put the corn off the machine with great regularity in the form of sheaves without bands, and eight men followed who made the bands and bound up the sheaves. That he thought was preferable to using the rake at all. It was necessary to have two clever men to manage the reaper and eight other men to follow. He had no doubt that with such a force as that they could reap eight acres a day comfortably. At first they yoked two horses, but the weather being very hot a third was added, and a boy was employed to lead the first horse. That was found much easier. They worked the horses about two hours, and then replaced them by fresh ones. The work would have been much easier but for the hot weather. He had not calculated the cost, but he was quite certain it was less per acre than if reaped by the sickle or scythe."

Mr. Shaw of Bramlingham, who had found the machine, on trial, to gall the shoulders of his horses, made that enquiry of Mr. Brown, and in reply he stated that the machine was best worked by *three* horses in re-lays, so as to rest two hours each. The man with the rake also found it extremely heavy work, and it was desirable to relieve him by alternating the work with the driver occasionally. On the ground of expense, Mr. Brown stated that eight acres per day was all that could be depended upon. This required six horses, in re-lays, and in all ten men. As horses are doing little in harvest, and as only three are really at work at once, we think much ought not to be charged for them. Then inferior men and even boys are quite sufficient for the following, so that the mowers, the most expensive men, can be dispensed with.

Assuming 7s. to 8s. per acre to be a fair price for the ordinary harvesting of corn, we shall have a cost of (taking the highest figure) 3*l.* 4s. for 8 acres of land. With the machine say—

	£	s.	d.
Two men at 2s. 6d. per day . . .	0	5	0
Boy to drive 1s. 6d.	0	1	6
Eight men to follow at 2s. . . .	0	16	0
Three horses, say at 4s. each . .	0	12	0
	£1	14	6

Leaving a clear difference of £1 9s. 6d. on the eight acres, a some 3s. 6s. per acre saving, as well as getting the corn more rapidly done.

Altogether a great many practical lessons may be taught by the meeting and its adjuncts.—Gardeners' and Farmers' Journal.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

THE STONE QUARRIES OF SWANAGE.

Letter XXVIII.

(From the Morning Chronicle.)

(Continued from page 110.)

When a quarry is taken, whether by one or more lessees, it of course requires several hands to work it. The number generally engaged in and about a quarry varies from six to twelve. When the adventurers themselves are in sufficient force to work it, no hard labour is called for. But it is seldom that you see a quarry where all those at work are master quarriers. It is not uncommon that you find two or three of them working a quarry in partnership, having five or six hired men about them to aid them in the work. The father is frequently found thus in partnership with his grown-up sons. In other cases a man, if his family is pretty numerous, may work his quarry with the aid of his sons alone, who may yet be all in their apprenticeship. The first practical operation is the sinking of the shaft, which is the only portion of the work requiring a little money capital on the part of the adventurer. The expenditure of this capital is, generally speaking, the best guarantee that the lord has that the quarry will be properly worked. The shaft is not sunk perpendicularly, as in most other mines, it being generally constructed at an angle of about 45 deg. It presents the appearance of a large hole in the form of a parallelogram, nearly perpendicular at one end, but slanting down at the other, at about the angle named. It is by the slant that access is had to the quarry, and the stone extracted is elevated to the surface. Along one side of this slant or inclined plane, rude steps are constructed for the ascent and descent of the men. The rest of it is paved with flags, up which a truck is dragged with the stone which is being brought to the surface. Sometimes the motive power is a capstan—at others it is a horse. When the latter, the horse is, in some instances, joint property, and does duty at more than one quarry. The depth of the shaft is regulated by that of the vein under the surface. There are three veins of stone lying parallel to, and at pretty regular distances from, each other. To reach the first vein, the shaft, according to circumstances, must be sunk for from forty to seventy feet. It is at the bottom of the shaft, when the vein is reached, and right under the perpendicular end of the shaft, that is to be found the real entrance to the quarry. It looks precisely like what it is, being neither more nor less than the entrance to an artificial cave. A horizontal passage is first driven from the foot of the inclined plane into the vein, from which "lanes" are struck off in different directions, in which lanes the quarry is worked. Generally, to get at the vein, a superincumbent stratum of solid but worthless stone has to be penetrated. Under this, and separated from it by only a very thin layer of clay, lies the first vein, in working which, the stone above forms a safe and substantial roof for the different lanes. They do not trust to it entirely, however; for, as the lanes are widened, the roof is propped up by the rubbish which is accumulated. Thus, if a lane is originally constructed about eight feet wide, it is never permitted to exceed that width; for, to the extent to which the solid mass is excavated on the one side of it, the roof is propped up by the rubbish on the other. In some places the vein is six feet in depth, in which case it is all worked, when the men have sufficient room to stand at their labour. In others, however, it does not exceed three feet in thickness, when no more of the mass above or below is removed than is absolutely necessary to enable the men to work it. Thus, while some lanes are six feet high, others are not more than four, and the smaller the space, of course, the more laborious the occupation. Whenever they choose they can sink to the second or third veins. Many have gone to the second, but few to the third. Such as have done so have their shafts from 100 to 150 feet deep. The stone is excavated with comparative ease, lying as it does in horizontal layers, in contact with each other, and having numerous perpendicular fractures, which enable the men to detach it in blocks of different sizes from the mass. If the layers are thin, the produce is paving instead of block stone. Most quarries produce both, whilst in some the layers are occasionally found so thin that a species of slate stone is extracted from them. The stone is brought to the surface in the rough, where it is dressed and made ready for market by workmen who seldom descend into the quarry at all. This is frequently also the work to which apprentices are first put. The highest grade of work is that under ground. The work below is, of course, all conducted by candlelight; which, as may be supposed, does not add to the purity of the atmosphere in the lanes. Sometimes the quarriers complain very much of the "damps," particularly during the summer season. When the lanes are run very far back—and they are sometimes so run for hundreds of feet—it becomes advisable, as well for the additional working facilities which it will afford, as from sanitary considerations, to construct an additional shaft. Sometimes, for the sake of proper ventilation, a lane will be run through to an old quarry, which may be close at hand. At others, the owners of two contiguous quarries will agree to run a lane from one to the other for the same purpose.

When the stone is dressed and ready for market,

it is conveyed in waggons to the harbour. The farmers who lease the surface under which the quarries are worked, claim the right of carriage between them and the beach. This claim is acquiesced in, but the result is that the quarriers pay a much higher freight than they would otherwise do. If in any case the farmer should decline the carriage, the quarrier can then look where he pleases for his means of transport.

All the means and appliances of labour about the quarries are of the rudest description. Main force is the element principally relied upon, but little aid being derived from machinery. Long as the district about Swanage has been quarried, and immense as has been the quantity of stone shipped from it, it does not, even to this day, possess a pier or jetty of any description. The vessels which receive the stone lie at anchor in the bay. The stone is dragged from the shore by very tall horses, in carts with very high wheels, as far into the sea as such an apparatus can venture with safety. From the carts it is consigned to the vessels, by means of barges, which are constantly plying to and fro. Could there be a ruder contrivance than this? Yet it is in perfect keeping with everything around.

But the most extraordinary characteristic of this singular social development still remains to be described. The world has long been divided on the subject of the standard of value, and the question of the currency is one that has baffled the most profound statesmen and the most astute economists. In Swanage these questions have received a very easy solution. The virtual standard of value is the article chiefly produced in the district—stone. But as silver is to the only standard of value, gold, in the national currency—so is bread to stone, the recognized and accepted standard in the currency of Swanage. This may be very new to the reader, but it is very ancient in this remote nook of Dorset. Stone is virtually in Swanage the standard of value, and the currency is composed of stone and bread. There is scarcely any coin in circulation in the district. All payments which are not made in actual money—those so made being very few—or in goods, are made either in stone or in bread. The workmen in the quarries are paid in stone, and it is for stone that they receive in exchange such articles as they consume. It is quite true that there is a money value put on everything, but stone is almost the universal substitute for money. Thus when a master quarrier takes a quarry, and hires workmen to assist him in his operations, a money value is put upon their labour, and they are engaged at so much per day, or so much per week. But when the time of payment comes, no money passes between the master and his workmen, but a portion of the stone produced, equal in value (taking its current value for the week) to the sum at which the workmen were in each case hired, is set apart for them. Thus, if a man was hired at the rate of 3s. a day, instead of getting 18s. at the end of the week, he would get 18s. worth of stone. The stone so apportioned to him would in that case constitute his sole means for commanding the necessaries of life for himself and family. Sometimes, instead of the stone, the quarrier gives his workmen orders upon the merchant with whom he has credit. But still it is the stone that does it all, for it is upon the credit of the stone that the orders are executed. The course of dealing between the master quarrier and the merchant will serve to explain the whole system.

It is necessary to premise that the word *merchant* has, in Swanage, a peculiar local signification. There are here two classes of merchants in the ordinary acceptation of the term. There is, in the first place, the class of independent dealers who sell their goods for ready money, when they can get it, or for bread, which they afterwards convert into money, but who never deal in transactions having the transfer of stone for their basis. There is, in the next place, the class to whom the term *merchant* is exclusively applied, who keep a general assortment of goods, which they exchange for stone. Each merchant has a bakehouse attached to his establishment, the bread baked at which is one of the chief articles which he exchanges for the stone. His shop is thus, in one sense, a bank of issue; for he manufactures in it that which forms half the currency of the district—and its entire currency, in the way of small change. Every quarrier must have his merchant, as every man of business elsewhere has his banker. To establish a credit with a merchant, the quarrier must deposit stone with him, and the extent of the credit is regulated by the quantity of stone deposited. The merchant has what he calls his *banker*, which is neither more nor less than the spot of ground on which the stone left with him is deposited. The banker is like the vault, and the stone like the bullion deposited in it. The quarrier may make his deposits in the banker when he pleases and to what extent he pleases, until the merchant, for reasons of his own, refuses to receive any more. An account is kept by both parties of the quantity deposited, as well as of the goods taken by the quarrier, or on his order, from the shop. When he wants to know how he stands he takes an account, and the balance, in the shape of stone, which remains to his credit in the banker, indicates the extent of his worldly means. When the stone is deposited a money value is set upon it, according to the current price of the day, that price being now about 21s. 6d. per hundred superficial feet of paving stone. The goods are also sold at a money value, so that the accounts between the parties are, as elsewhere, kept in money. When the quarrier pays his men in stone, they must have their merchant, as he has, to turn it to account. When he pays them by order on his merchant, he of course takes all the stone and deposits it, to his own account, in his merchant's banker. The merchants dispose of it as they best can, Southampton being one of their best and most accessible markets.

So far the system savours considerably of transactions based on credit. But there are, as it were, ready money transactions, in which stone figures as currency. A pair of boots, for instance, is sometimes paid for at once in stone. At some of the public-houses they take stone in deposit; at others, if a man wants a pint of beer, he must wheel a barrowful of stone to the house to pay for it. But in the great majority of transactions of the ready

money kind, bread is the currency in vogue. Although the merchants keep a pretty varied stock, it is generally in the shape of different articles of food, bread being the principal. If a quarrier, therefore, wants a coat, a pair of shoes, or anything else for himself or family which his merchant has not got, he has to go to one of the independent dealers who can supply him. But they not dealing in stone, and he having no credit with them, he is obliged to procure from his merchant that which they will take in exchange for what he wants. This is generally—in fact almost invariably—bread. He therefore draws for so much bread upon his merchant, which he carries to his clothier or his shoemaker, and gives in exchange for what he procures. It is in transactions like these that the system works with peculiar hardship to him. The result of the whole system is to make almost every necessary of life 15 or 20 per cent. dearer in Swanage than elsewhere in the neighbourhood. Thus the loaf which can be got for 5d. in Poole, is valued at 6½d. in Swanage. But it is only so valued to the quarrier when he takes it from his merchant. When he exchanges it for anything else, at the independent dealer's, he can only get 5½d. for it, or 5½d.'s worth. He thus loses a penny on every loaf which he turns to the purposes of currency. A quarrier in whose house I was seated conversing on the subject, sent during the interview for some ale. His wife took with her a 6½d. loaf, and brought back 5½d.'s worth of beer. The stranger, ignorant of the purpose to which bread is thus applied, would be utterly at a loss to account for the quantity which he would see carried about in all directions. If a woman wants a piece of ribbon she must take a loaf with her to the shop. The dealers afterwards convert the bread into money at the price at which they receive it—those who ultimately consume it thus getting it at a penny a loaf less than the value at which it was originally issued from the merchant's establishment, and all at the cost of the poor quarrier. But this is not the only disadvantage under which he labours, for whilst his stone is taken from him at the lowest—and the bread and other articles which he receives from his merchant are given to him at the highest—possible rate, such commodities as he afterwards purchases from the dealers by means of his bread are highly overcharged; whilst that in which he pays for them is reduced at the counter fully 16 per cent. in value. Thus, although the wages of a quarrier may nominally be 3s. a day, they are virtually reduced to 2s. by the series of peculations to which he is subjected. But even of the master quarriers, few can be said to average 3s. nominally a day. The average nominal wages of the working men, as contradistinguished from the masters, are from 2s. 3d. to 2s. 9d. a day. This, in reality, is but from 1s. 6d. to 1s. 10d. a day. They are also subjected to another great inconvenience by the length of time which sometimes elapses ere the merchants will balance their accounts with them. Some are careful to have a balance struck every year, but there are cases in which years elapse without any settlement of accounts. This leads some of them astray as to their real standing, whilst it begets reckless habits in the more thoughtless of them. These latter, so long as they have credit at their merchant's, care little how they stand, so long as the day of reckoning is postponed. Others, again, meaning to stand well, find themselves at last unexpectedly in debt, when they thought they had a balance in their merchant's hands.

There is little money in circulation in the town and district; house rents are exacted in money, and so are the lord's dues. To enable the quarriers to meet these demands, and also the rates which are levied upon them, the merchants, instead of goods, allow a certain sum of money to be drawn each week by their depositors. It is seldom that this sum exceeds 2s. 6d. per week to each depositor. This enables them to meet the demands in question, and also occasionally to buy a little fresh meat, which they do not often enjoy, and for which they have invariably to pay money.

They bitterly complain of the inconvenience and losses to which they are subjected from the almost total absence of money from their ordinary every-day transactions; and they are most anxious that some merchants would come amongst them, who, taking their stone at even a lower valuation than now, would pay them money instead of giving them goods for it. In this respect matters do not seem to be improving with them, the more advanced in life amongst them saying that there is less money in circulation now than formerly. But their universal desire is, at any reasonable sacrifice, to commute their present earnings into money. If a money system were established amongst them, instead of the present system of limited barter, not only would the price of the necessaries of life fall, and their physical comforts be thus increased, but the habits of some of them would be greatly improved.

Taking their condition throughout the year, they are, on the whole, considerably better off than the agricultural labourers throughout the country. Their houses are, generally speaking, vastly superior as regards accommodation, and consequently as regards cleanliness and healthiness, to those of the labourer in the fields. There is an abundance of the best material for constructing them at hand, and they are in many cases provided with four or five rooms. With the exception of Hop-about-lane, the houses in which are of a very inferior description, the dwellings of the quarriers in Swanage may be characterized as spacious, clean, and comfortable. Their furniture and bedding are also abundant and clean. They generally pay from £4 to £4 10s. in the shape of rent, in addition to which they pay rates amounting to nearly £1 more. Their diet, too, is also, in the main, better than that of the farm labourer. They seldom eat fresh meat, but they consume more bacon than he does. But even of this they have a very insufficient supply, considering the laborious character of their occupation.

They are generally very ignorant, and in the majority of cases almost entirely illiterate. If any of them attend school, they are sent too early to work to derive much benefit from it. The boys, at about nine years of age, become useful about the quarry, and they are sent below as soon as they become strong and skilful enough for underground work. The bulk of the quarriers adhere to the

Church, the rest being chiefly divided amongst the Methodists and Independents. On the whole they are considered an orderly and well-regulated set of men.

But few, perhaps, of those who read this account were aware, before perusing it, that so rude and primitive a state of society is to be met with within a few hours' ride of the metropolis.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

FRANCE.—No. XXIV.

THE VALLEY OF THE RHONE—ITS GENERAL AGRICULTURE ABOUT AVIGNON.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

I propose to devote the greater part of the present communication to some account of a farm in the valley of the Rhone, over which I was conducted by its able and obliging proprietor, M. Guebhard, one of the most enlightened and scientific agriculturists of the country—a gentleman, indeed, whose system of management, if carried out through the district, would render the cultivation of the department of the Vaucluse very different from what it is at present, and far more productive. Mr. Guebhard is eminently a practical man. An enterprising landowner, he devoted himself personally to the improvement of his estate—fought his way triumphantly through every obstacle of prejudice and ignorance—introduced systems and practices which made the hair of the old jog-trot men stand on end—and, after unnumbered prophecies of ruin and bankruptcy with which he was every day for years saluted, finally succeeded in extracting regularly from his land three or four times the produce which it had given under the ancient *regime*. And here comes the characteristic moral of the tale. The facts are perfectly known in the neighbourhood. The farm of La Motte stands out from all its rivals a model of neatness, luxuriance, and productiveness; yet, with one single exception, not an agriculturist around has sought to profit by the lesson or to reap the benefits of the La Motte agricultural reform. The spirit of routine, like the Goddess of Dulness in Swift's "Battle of the Books," broods over all the country besides; and hardly a man will consent, whatever be the prize, to innovate upon the rural lore of his forefathers.

The farm of La Motte occupies one-half of a flat alluvial island of the Rhone. The road from Avignon leads across the suspension and straggling wooden bridges by which the Rhone is here crossed, to the right bank of the river, passing through the narrow streets of Villeneuve les Avignon, beneath the towering walls of the half-fortress, half-convent,—a twin structure to the sacerdotal palace of the Popes on the opposite bank, and which was for centuries occupied by a race of industrious monks who were the first to drain the river marshes beneath their battlements, and to exhibit the fertility, when properly managed, of the soil now called the *palus* of the Rhone. Bending to the north, the road then follows the banks of the river, skirting the range of bleak and rocky hills which I described in my last communication, and which rise as abruptly as a rough stone dyke from the rich alluvial flat beneath. Southward of Avignon, this hilly ridge retires to a greater distance from the river, and the olive groves crown it almost to the summit. To the north, the portions boasting a scanty layer of gravelly soil are terraced, so that not a foot of ground is lost, and thickly planted with vines. The soil in which these flourish is not unlike the gravelly strata which overlay the best parts of Medoc. The wine produced is, however quite another article, although in some districts tolerably rich and full bodied. The very stony vineyards, and those in which rocks are dispersed, are worked by hand with heavy instruments like two-pointed pickaxes. The vineyards in the *palus*, or reclaimed marsh, are ploughed three times a year; and in all cases the bushes are carefully cut and pruned after the vintage. Here, again, in talking of the fashion of pressing the grape with the feet—a method universal, I find, in France—I was assured by the most competent authorities that no press could do the work so well, that the human foot was the natural implement for obtaining the juice of the grape, and that the fermentation threw off all impurities. The fruit is gathered hereabouts without the sanction of the "authorities," at the good will of the owners. If the powers that be are, however, so far paralysed outside the walls of Avignon, I may mention *en parenthese* that they flourish in great glory within. An official placard, posted up on the box lobby of the theatre, forbids any spectator to hiss or manifest any signs of disapprobation at the first two appearances of a new artiste—"*par ordre de Monsieur le Maire.*"

Emerging from the outskirts of these straggling suburbs of Avignon, you find yourself advancing between rocks, gravel ridges, and olive trees upon the one hand, and an expanse of rich *palus* land (a great part of it under madder) upon the other, stretching in an uninterrupted flat to the edge of the river. This portion of the soil is much subdivided, the proprietors and cultivators living in Avignon, or its outskirts. Large farms are not, however, wanting; and the madder fields upon such are generally beautifully kept—the beds separated by *emblans* running as straight as arrows, and not a clod the size of a marble to be seen. The land is heavily timbered. Mulberry and olive trees, willows and poplars, run along the hedgerows, and supply a great portion of the fuel of the country. Coals and coke are, however, extensively used hereabouts for fires, as well as wood. The former come principally from St. Etienne, not far from Lyons, and are floated down the Rhone in huge clumsy barges—as frail and rickety craft indeed as ever ventured with heavy freights

upon a rapid and turbulent stream. A smaller quantity of fuel is brought from the coal mines of the Grand Comb, near Nismes; the price of mineral fuel is, however, very considerable. Coal costs as much as 50 francs per ton, and coke as much as coal in London. I am informed that, when the contemplated branch of the Marseilles and Avignon Railway, from the present terminus in the former town to the quay, shall have been completed, little save Newcastle coal will be burned in the district; the English mineral being far better, and, when proper facilities for transhipment and carriage are given, decidedly cheaper than that which the neighbouring collieries can produce, English ships coming to Marseilles for corn frequently bring coals as ballast. The freight of the commodity is thus very low.

To return, however, to my visit to the farm of La Motte. The olive trees hereabouts are in general small and not very profitable. Great quantities of them do not yield more than two franc's worth per annum. The mulberries produce a more certain harvest, without requiring such expensive culture. Some of the best of the latter will give as much as fourteen to sixteen francs' worth of leaves yearly; but the general average is far beneath this, not being much more than that of olives in a tolerably favourable season. The small proprietors hereabouts break up the ground either by spade husbandry or with miserably inefficient ploughs, drawn each by a small horse or a donkey, and describing mere scratches on the earth. Although they are accustomed to dig deeply for the production of madder, these people never seem to think that a corresponding culture ought to be bestowed upon corn. Incidentally, however, the deep madder culture has of course its effect upon the land when wheat or barley comes to replace the dye stuff.

The cross road leading from the highway to the bank of the river, where the ferry to the island of La Motte is established, I found to be no bad specimen of the French local country road—a miserable concatenation of ruts and inequalities, which demands good springs in the vehicle traversing it or else no springs at all. The communal and vicinal roads in France are generally capitally kept; but when the duty devolves upon a number of farmers, to be performed at the good pleasure of each, what is every body's business becomes nobody's. Quarrels are constantly breaking out as to the quantity of work requisite upon the road, and so far as communication goes, a farmer generally deems it more economical policy to put on an extra horse or two to his wains, to drag them through the mire, than to set his people to work to fill up the ruts and get the track into a passible condition. Arrived at the edge of the river, we found ourselves in a jungle of young willow or alder trees dividing the fields from the streams. Hedges of rushes, or rather canes—of the bamboo species in appearance, but not so tough or elastic—grew around to the height of eight or ten feet. These when split open and stretched upon framework, are used for making the beds or shelves upon which the silkworms are brought up and fed. The ferry boat was a wan old barge, with a short stump of a mast in the bows, athwart which ran a a stout hawser from bank to bank, by hauling upon which the boat was moved across the brawling stream, rushing tumultuously between its low sandy shores of grass and willows.

The farm of La Motte occupies, as I have hinted, half the island upon which we now landed. The whole circumference of the place, however, is walled round by an earthen mound some ten or twelve feet in height from the surface of the water, and sufficient to defend the property from ordinary inundations. The Rhone, however, is a wild and uncertain river, and, when once it rises in its strength, swamps dykes and embankments like chaff. The last great flood was in 1840. It destroyed vast quantities of arable land along the river banks, first tearing away the soft alluvial matter, and then considerately leaving sand and shingle in its place. Upon the occasion of the flood in question, the farm house of La Motte rose like an island above the clayey torrent which swept furiously past it, driving torn up trees and farm or household wreck in a dismal chaos upon the surface. The dyke was broken in at several points, patches of sand and gravel encumbering the pasture lands still remaining to tell the tale. Occasionally, in these inundations, the fitful river does good as well as evil, clothing in a few days ground which has hitherto been waste and barren with a rich layer of deposit, capable of producing the most luxuriant crops; the godsend of one proprietor having, of course, been the misfortune of the other. The interior portion of the dyke of La Motte, and a narrow stripe of ground in its vicinity, I found covered with natural herbage, and forming the principal pasture ground of the sheep reared upon the farm. The soil inside was broken into cavities, from which the earth to form the mound had been dug. Here and there, patches of earth extended outside the barrier to some distance in the river. These were also covered with abundance of rank grass, and thickly grown with young willows and poplar trees. The quickness of growth of these is surprising. They are cut once in three years, the timber being the property of the landowner; and by that time, from natural shoots, the trees have generally attained the height of at least a dozen feet. Every year the young wood is thinned, only the largest and most thriving saplings being permitted to remain. This work is got through in winter, when the weather is too severe for the performance of the farm duties, and the thinnings are the perquisites of the cultivator. The pollard willows, which I have repeatedly mentioned, are also pruned once in three years, the shoots being cut down to the head of the trunk. A good pollard will yield from four to six francs each cutting. The wood, when first rate, is used for hoops—otherwise for fuel. The poplars and willows furnish planks, and contribute a handsome share to the revenue of a *palus* proprietor. The latter tree occasionly suffers from the ravages of the castors or Rhone beavers, a race of animals which has been a good deal thinned by recent inundations tearing up the banks in which they burrowed. They are rough piled creatures, more shaggy than their transatlantic brethren, living on

grass, water-herbs, and the bark and soft wood of the willow, which they gnaw to the core. They are caught in traps formed by digging holes, and sinking casks therein, along the tracts which the animals frequent.

Inside its protecting mound, the farm of La Motte is, for the most part, a flat expanse of calcareous or rich alluvial soil; the fields divided by rows of pollards and mulberries. The property consists of 720 emminays, equal to nearly 150 English acres. It is let for 9,000 francs per annum, or about £370—an apparently large amount for France; but the general rate of rent in the Vaucluse is much above the average of the south; and as there exist upon the land upwards of 6,000 mulberry trees, the products of which, after all expense of culture has been deducted, the proprietor calculates as at least sufficing to defray half the rent, the total amount does not appear so formidable. The rate, indeed, is only 12½ francs per emminay, while the price paid for the use of land hereabouts not unfrequently ranges from 14f. to 25f., according to the quality of the soil, and the situation of the farm. The rent, I ought to observe, is usually taken to represent the net profits which the proprietor would draw from his land, after every expense was paid, were he in the practice of cultivating it himself. M. Guebhard's farm of La Motte is now under the management of an agriculturist—an intelligent and experienced, though unlettered man—who was trained in a school of improved and enlightened cultivation under the proprietor's eye, when he farmed his own ground. On coming into possession of the property, M. Guebhard found that, under the system of culture then in operation, wheat gave a return of 6¼ fold, oats of 10 to 11, and barley nearly the same. In the course of a few years he obtained from wheat 21¼ fold, from oats 40 fold, and from barley an almost equal ratio. The weight of the grain produced per hectolitre, when M. Guebhard commenced his operations, was—wheat, about 65 kilogrammes; oats and barley about 32 kilogrammes. Under the system which he introduced, he speedily succeeded in producing wheat weighing 82 kilogrammes per hectolitre, and oats and barley averaging 49 kilogrammes. The reforms which worked this result consisted of a thorough change in the whole alternate white crop and fallow system of the country; in very deep ploughing, stirring up the earth to the extent of at least two feet; and in a judicious and liberal use of manure. The agriculturists in the neighbourhood looked on in fear and wonder at the introduction of these practical heresies. First, they opined that the man who plunged into such daring innovations was a down right lunatic; then they so far modified their opinion as to content themselves with speedy prophecies of the ruin of the projector. The principal and managing servant of M. Guebhard, now his farmer, although he helped to carry out all the new theories, shook his head with the rest, and dolefully awaited the predicted crash, which happily however never came. When M. Guebhard gave up cultivation, he let the farm to this individual, whose prejudices had at length been so far rooted out, upon the condition that the new plan of cultivation should be strictly and in every particular carried out. The farmer has been true to his pledge, and the property of La Motte, although deprived of the owner's immediate superintendence, still stands out a striking contrast to neighbouring *exploitations*.

I mentioned that M. Guebhard changed the *assolement*, or rotation system, as one of his first improvements. He adopted a 10 or 11 years' shift as follows:—For the first five years, successive crops of lucerne or Spanish trefoil. In the sixth year he ploughed up half the lucerne in each field, sowing in the interstices thus obtained such green crops as vetches and haricots. In the seventh year he turned up the remainder of the lucerne, and stirred the ground thoroughly with a large subsoil plough, drawn by a dozen of horses, and laid down wheat obtaining large crops. The eight year he devoted to oats. In the ninth, the ground was again thoroughly loosened, richly manured, and planted with green crops, potatoes or peas, or sometimes oats, to be cut down green as summer food for the cattle. In the tenth and eleventh years the ground was laid under successive wheat crops—the plough and the manure cart having, however, been previously actively employed.

Under the old system, and that, indeed, which still prevails extensively in the district, lucerne is commonly grown for fifteen successive years, and corn land is cultivated every second year, being left in fallow in the alternate seasons. Thus, over many farms the practical result is, that only half the land is really cultivated. The system of resorting to green crops instead of leaving the earth absolutely idle, is gradually, however, being shaken by notions of improvement creeping in from the north, where the practice has been for many years generally abandoned. The manure which had been formerly applied to his land M. Guebhard conceived to have been too hot and dry, considering the long and sultry droughts to which Provence is liable. He changed the system therefore, and dug a large hole near the cattle trough, into which all the overflowings of the latter habitually oosed. Into this hole all the manure and litter of the farm-yard, from the stables, piggeries, and sheep cots, was conveyed and left to be tolerably well saturated with the slowly trickling water. The happiest results followed the application of this moist compost, and the practice is still kept up. The quantity of manure obtained is nearly double that which would be placed upon the land in its dry state, and, for a strong stiff soil frequently reduced to dust by the summer heats, the composition is found to be fully as forcing as is necessary.

Upon the farm of La Motte the owner kept the following live stock:—22 horses, 4 oxen, 1 cow, and 100 sheep. Straw and lucerne formed the principal fodder of the large cattle. The sheep were mainly fed out of doors upon the mound, or *chaussee*, the broken ground near it, and among the willow thickets close by the river. The animals—for the most part ewes—were purchased at the average price of 15f. In this part of France a ewe, well fed, will produce upon the average three lambs in two years. A proprietor of sheep generally counts upon doubling the capital invested in the

flock, by means of the lambs and fleeces, every year. The young animals are ordinarily consigned to the butcher at three months old. Oxen, when purchased young and lean, but in good working condition, may be had for about 250f. Their value when fattened ranges from 600f. to 800f.

The labourers employed on La Motte were a *chef ouvrier*—the present farmer and his wife. The pair received for their services 600f. per annum, and, of course, board and lodging. The principal duty of the female was cooking for the other farm servants, consisting of a gardener, at 300f.; a shepherd, at 300f.; and six garçons de ferme, receiving different yearly sums, from 200f. to 300f. This was for the ordinary cereal purposes of the establishment. The special work requisite for madder is, as I have explained, always performed by skilled day labourers, and the operations in the manganerie, or silk worm breeding place—which most farms possess, and in respect to which future details will be given—are also extra items, seen to by workmen experienced in the proper processes.

The following are synoptical sketches of the manner in which the crops upon the farm were divided at two different periods.

ALLOCATION OF FARM IN 1838.

Emminays of 100 sq. ft.

4	in seedling plantations of mulberries.
31½	in vines.
28	in mulberries, large and dwarf.
122	in lucerne, for fodder.
17	in clover.
12	in vegetables, such as haricots, potatoes, peas and beet-root.
24¾	in madder.
24	in mixed crop of oats and vetches.
232	in wheats of different kinds.
128	in other cereals, such as barley and oats.
3¾	garden ground.
4	orchard.

ALLOCATION OF FARM IN 1839.

Emminays of 100 sq. ft.

31½	in vines.
5½	in gardens—flower and kitchen.
24½	in seedling mulberry plantations.
110½	in vegetables for family use and feeding cattle.
40	in mixed crops of oats and vetches for the cattle.
15	in barley and rye, to be cut green for fodder in the spring.
20	potatoes, haricots, and beet-root.
125½	madder.
4	orchard.
228	wheat of different kinds, including Turkey wheat for fowls.
83	oats.

From the same records kindly placed at my disposal, from which I have extracted the above statements, I abstract several memoranda of agreement between the proprietor and the small tenants, to whom at different times he let out portions of the land upon metayer principles. The memoranda in question will give a practical view of these agreements as they are understood and acted upon in this part of the country:

NOTE OF AGREEMENT BETWEEN A PROPRIETOR AND HIS METAYERS FOR THE CULTURE OF MADDER.

"The proprietor binds himself either to furnish to the metayers the land turned up by the deep soil plough, or to pay to those who have themselves turned up the ground to the depth of two feet, one half of the price of the operation.

"The seed to be furnished by the metayers.

"The expenses of sowing, weeding, and digging up to be at the charge of the metayers, the proprietor paying 10f. per emminay after the last operation

"No Turkey wheat to be sown in the emblans or spaces between the beds. Potatoes, beet-root, and haricots to be sown at the pleasure of the metayers; two-thirds of the produce to go to them, one-third to the proprietor.

"The seed and the above ground portion of the madder to be divided share and share alike.

"The metayers to keep the ground always free of weeds. In case of non-performance either of that or of any other duty at the proper time, the proprietor to have the power to get the work done after having once in vain warned the metayer, and to keep back the proceeds in the sale of the crop.

"The madder to be dug up every three years, but not without the authorisation of the proprietor. The plant to be dryed in the fields by the metayer.

"The whole amount of the harvest to be fairly divided, pound for pound, between the proprietor and the metayer."

ANOTHER NOTE OF AGREEMENT BETWEEN A PROPRIETOR AND METAYER.

"Proprietor is bound as follows:—

"1. To have the land ploughed with the great or subsoil plough.

"2. To pay 10 francs per emminay upon the digging up of the crop.

"3. To claim no more than a just half of the crop.

"4. To claim no more than two-thirds of the produce of the emblans.

"5. To claim no more than one-half of the seed, if there be any."

"The metayer, on the other hand, is bound as follows:—

"1. To prepare the land well for the reception of the seed.

"2. To furnish the seed.

"3. To sow it.

"4. To weed the land as much as may be necessary, and when the operation may be necessary.

"5. To cover up the sprouts in proper season.

"6. To turn up the roots with the plough at any epoch which may suit both proprietor and tenant from the last day of August to the 15th of October."

The whole of the farm with respect to which these agreements were made is now, as I have stated, cultivated by one individual. I proceed to sketch with some minuteness the features of the steading and establishment within doors and without.

As usual, there is but one dwelling house upon

the land, for the proprietor to occupy if he chooses, or for the farmer to live in, if the landlord prefers, as in this country he all but invariably does, to reside in the nearest town or in the capital. The result of this arrangement commonly is, that the mansion having been built upon a rather large scale, a limited number of rooms only is occupied by the actual tenant, who, when he has obtained a good kitchen, and a bedroom in its vicinity, troubles himself very little about superfluous accommodation, and either leaves the greater number of the apartments desolately empty, or converts them into store places and small granaries. In the present instance, the general cooking and living room was a model of cleanliness and homely comfort. In general features it sufficiently resembled an old-fashioned English farm kitchen. Over head stretched massive old black beams; the grate was of the true ox roasting dimensions, with enormous flanking ledges of stone, and the capacious pot-au-feu hung over the blazing fagots by a chain and crook, after a fashion frequently adopted in Scotland. The food of the animals as well as of the individuals of the establishment, was, when necessary, cooked here. Before our departure I observed a pot of cut-up lumps of beet-root, which the "good-wife" was simmering for behoof of the inmates of the pig stye. On one side of the fire, and within the capacious jaws of the grate, extended a neat and handy cooking range, with conveniences for stewing by means of charcoal—a decided culinary step in advance upon the great roaring open fire-place. Round the walls plates and dishes—of coarse brown ware, but shiningly clean—formed the principal article of garniture. The spoons of pewter, were arranged in tin receptacles, so as to form a set of culinary "devices" after the fashion of the circular arrangements of pistols and so forth which one sees in arsenals.

Dressers and meal-chests, very much like the old-fashion *girnels* of Scotland, were grouped around the massive deal table at which the whole household dined. An odd piece of etiquette in these rustic dinners is, that the farmer alone has his bottle of wine upon the table—an allowance which he keeps religiously to himself, or only shares with the guests, if such there be, above the salt. The farm servants are obliged to rise and fill their glasses from large beakers set forth upon the side table, every time they wish to drink. I need hardly say that the custom has its origin in motives of economy. Although no outward restraint is placed upon the consumption of the liquor, Jacques or Jean will not fill and empty his glass half so often if each bumper is to be procured only at the expense of a walk to the other end of the room, under the eye of his master, as if all he had to do was to stretch out his arm, fill his glass, and empty it. Above one of the dressers hung a sort of wicker-work screen, suspended from the ceiling, and heaped with bread—good coarse wheaten loaves, excellently tasted, to which the whole household had free access. The bread was, of course, home-made. The gardener was the baker, operating once a week. The oven was a projecting portion of the building—off the kitchen—fitted with a suitable furnace. M. Guebhard informed me, that during his residence at La Motte, for a family of twelve persons, counting two women as one, they used to bake weekly not less than 120 loaves, each of 3lb. weight—being an allowance of 30lb. of bread per head per week. At harvest time the quantity baked was prodigious—about 250 loaves if I remember right. In fact, one must see a party of French peasantry at dinner, perfectly to realize the fashion in which the staff of life disappears. I witnessed some admirable performances in this line by the vintagers of Medoc. Nearly above the kitchen was the chamber of the farmer and his good dame—a most decent, cleanly, double-bedded room, the walls covered with cheap and gaudy religious prints, emblems, and devices. Here, I was told, the silk-worms were very generally hatched from the eggs in the spring, the chamber, with its large fire-place, being well fitted to supply the necessary warmth. The process, I believe, occupies but a short time—some four-and-twenty or thirty hours. Some of the small breeders, I am informed, have a most notable fashion of hatching the larvæ without any expenditure of coal or wood. They wrap up the eggs in blankets and go fairly to bed with them, remaining snugly muffled up until the worms appear. This is a common practice with the peasantry of the Cevennes. The late Mr. O'Connell once recommended that the Irish judges should be set to hatch turkey's eggs, that they might not sit entirely for nothing; but the Cevennes mode of producing silk-worms is the only actual realization of the abstract idea which it has ever been my fortune to fall in with.

Almost all the other quondam living rooms of the house were either empty, or converted into granaries or storehouses. The male farm servants slept—the shepherd and a boy—in the sheepcot; the others in a granary above the stable. The cot in question was a substantial wooden and thatched structure, the walls and roof tapestried with cobwebs hanging in enormous folds from the beams. The byre and stable were in the selfsame condition—the reason for the apparent neglect being an idea, very prevalent among the country people hereabouts, that cobwebs suck up the bad humours or grossness from any sore or incidental wound under which the sheep or cattle may be suffering. When M. Guebhard was in possession, having no particular respect for the superstition in question, he caused walls and roofs to be cleared from their spider-spun tapestry; but on his quitting the actual management, the old *régime* so far revived. In the sheepcot I found a couple of well-littered pens—one for the very young lambs who were not considered to be strong enough to accompany their mothers to the field; the other for the older lambs fattening for the butcher. The dams of the former were brought home twice a day to suckle their progeny. The shepherd and a coadjutor slept, as I have stated, amongst the charge of the former. They had two raised cribs stuffed with straw, and furnished with blankets. The other servants in the granary were furnised with similar couches. In many farms, however, no bedclothes whatever are provided, the poor fellows sleeping in their clothes; a mode of passing the night, which is, however, by no means objected to by French peasants of the class in question. The or-

dinary rule as to the time for going to bed and rising from it in a French farmhouse, is to follow the example of the fowls. In the winter time, however, all hands are stirring at least an hour before light, as the cattle have to be fed and prepared for their morning work, which begins with the first peep of dawn. Several of the lofts and granaries in the farm buildings of La Motte are devoted during the season to the rearing of silk-worms. I found the necessary apparatus heaped in corners. As the matter, however, will be treated at length in a subsequent communication, I need say no more at present upon the subject, except, perhaps, to state that a rude outhouse thatched with reeds was devoted to the winding of the silk from the cocoon. The female servants are the operators. The balls are placed in a copper basin of hot water fitted upon the top of a small insulated stove, and the winders ply their wheels on every side.

The garden was well kept, and principally, if not wholly, devoted to kitchen growth—great cabbages cutting a conspicuous figure among its productions. It was watered by means of a large well, and an endless chain of buckets, worked by a horse in ordinary mill fashion. This method of raising water is very common in the south generally, but particularly in the department of the Gard about Nismes and Montpellier. The apparatus there is much the same as that in use at La Motte. The jugs or buckets ascending full are tilted over into a central wooden pipe or channel, which, in the majority of cases, conducts the water into a large stone trough occupying the greater portion of a dark narrow outhouse. This trough acts as a reservoir, from which the garden, a market garden generally, is watered, in times of drought, twice a day. All manner of vegetables, after being cut or uprooted, are left swimming in this tank, until market time arrives. Sometimes small fields of corn in the immediate vicinity are also watered by the apparatus in question. The process is peculiar, and requires some skill and care to perform it with proper effect. The water is led in a small channel to the spot, while a labourer with a spade flings up a tiny mound, so as to force its course obliquely into the first furrow. When this trench is filled, the operator stops the entrance, and, making a breach in the original mound, admits the water into the second furrow, and so on, until the field has been sufficiently moistened. The practice is seldom, however, resorted to, even in the case of fields close to the wells, except in times of very long-continued and parching drought. The expense of keeping in full play one of the wells or pumps in question was estimated to me as from 1½ francs to 2 francs per day. While upon the subject of irrigation, I may add that the average charge made by the proprietors of the different canals to the east of Avignon for supplying water for the many artificial meadows there existing is about 30 sous the emminay, or more than 7 francs the acre. For this rate the owners or occupiers may lay their meadows under water as often as they please. The garden at La Motte was the only part of the exploitation regularly watered. It contained—a rare appendage to French gardens in the south—a row of wooden beehives. It was curious to see the insects hard at work, buzzing about the entrances to their dwellings, in December like English bees in June. They are regularly suffocated by the smoke of brimstone when the honey is removed.

The ploughs and larger farm implements were deposited in one of the principal out-houses. The largest plough, constructed to turn a furrow of more than a foot in depth, was furnished with wheels. Six or eight horses formed its usual team. Two smaller machines, drawn respectively by two horses, the shape of the coulter only differing, were called the *courtray* and the *araire*. A still smaller plough, drawn by a single horse or mule, and generally used to cover the seed, was termed the *fourcat*. The woodwork of these implements was generally very simple and primitive, the stilts being frequently formed out of a naturally forked branch. The pitch-forks in use are almost universally made after the same pattern. Corn is seldom thrashed hereabouts by flails, and never by anything approaching to thrashing mills. The use of horses to tread out the grain is almost universal, and occasionally, I am told, the patriarchal custom of employing oxen for the purpose prevails. The ground is previously prepared by a heavy roller, and made as hard and compact as possible. Sometimes, I believe, the animals employed to thrash drag after them a species of wooden framework, or hurdle, intended to aid the process of freeing the grain from the ear.

Tolerably moist as one would conceive a farm situated in a low island in the Rhone to be, an apparatus for admitting water from the river in dry seasons has not been forgotten. Different sluices and canals have been arranged to coincide with different levels of the river. It is only, however, in seasons of great and long-continued drought, that these waterworks are brought into play. The grassy banks of the ditches afford good bites for the sheep.

Altogether, then, the farm of La Motte—with its rich level expanses of arable ground, its luxuriant willow and poplar borders, its green patches of pasture, and its stately double lines of mulberries, is a good specimen of what can be made of the teeming soil of the valley of the Rhone. It was an excellent sight—leaving the jovial plenty and the hearty and kindly hospitality of the farm kitchen—to sally out beneath the sheltering trees, and to watch the stately march of the great plough, preparing the ground for madder, dragged by its steady-moving team of ten goodly horses, and flanked by the groups of lustily working labourers, stirring up the ground beneath the shelter of the well-pruned mulberry trees. The scene was what a country picture ought to be. Health and content, if not intelligence and acuteness, were stamped upon every honest industrious-looking face around me—from the farmer, who looked proudly on, and sometimes took a turn between the plough stilts, and his buxom dame, who seldom stirred from her engrossing duties by the fire, down to the labourers who trudged manfully by the team, or wielded the *bêche* or the spade, and the serving damsels who sang aloud at their work of washing in the neighbouring fountain.

The metayer system, properly so called, is going out of fashion in the lower districts of the Rhone, and for very much the same reasons as those to which I have attributed a similar state of things in

the neighbourhood of Marseilles—the difficulty which the proprietor finds in securing a fair *bonâ fide* half of the produce. The honesty of the farmers upon this point is universally distrusted. They are accused of playing all sorts of tricks to secure to themselves, not the metayer's, but the lion's share—tricks which can only be defeated by constant watchfulness on the landowner's part, and an intimate knowledge of the practical details of farming; conditions which very few French proprietors have, in one case, the will, and in the other the power, to put into profitable practice. Of that portion of the crop which is sold the landlord may be able to get his fair dues. The constant moot point appears to be the proportion of grain and green crops kept back by the tenant for home consumption, both in the farm-house and in the byres and stables—little or none of the value of which finds its way into the landlords' hands. To make the metayer system mutually advantageous, perfect *bonâ fides* must prevail between the two parties to the bargain. The farmer in particular, dealing with an individual usually ignorant of the ways of agriculture, has all manner of roguish resources at his command for the purpose of mystifying the real gross produce of the land. The consequence is, that proprietors are becoming more and more inclined to exact a fixed rent, the amount of which, I am assured, is considerably over the average profits reaped from farms cultivated by metayers; the difference being represented by the proportion of produce generally held back by the farmer, and from time to time during the season consumed by his household. The leases on which farms are granted usually stipulate that two or three crops—principally particular species of wheat—which are held to be unduly scourging, shall not be laid down. The land is usually held by the farmer for periods of six or nine years.

I hear dismal accounts of the mortgaged condition of the small proprietors' estates throughout the district, and I am everywhere assured that this state of things holds good, almost universally, through the south and east of France. The causes appear to be partially the continually advancing subdivision of of property, partially the mania of the people for buying land which they have no money to work, and very often not half enough to pay for. Frequently a young man, born and bred upon his father's small estate, and fit for nothing but hard agricultural labour, finds, when his share of the heritage is delivered over to him, that he must, somehow or other, get more land or starve. Another, who may have enough from which to scrape together a living, is still afflicted with the itch for increasing his landed possessions, and the result in both cases is the same. An additional patch is purchased with borrowed money—borrowed, too, very frequently at so high a rate that the produce of the soil, even if properly cultivated, would hardly pay the interest, far less the scanty yield extracted by hard, may be, but yet unskilled and still insufficient labour. Six or seven per cent. are common rates of interest paid, or promised to be paid, by the small proprietors. The lenders are generally such capitalists as petty tradesmen in the county towns, who have amassed some savings, or the lower class of notaries. In more desperate cases, the most usurious exactions are submitted to by the unlucky borrowers. Wretched driblets of money—a few francs at a time—are loaned for very short periods at exorbitant profits. Such a bargain as the borrowing of five francs for a month, to be repaid by six, or even more, at the end of the term, are not uncommon; and the lenders, of course, justify their conduct upon the risk which they run of never seeing either the five or six francs again. From such a state of things miserable social consequences cannot but steadily flow. Year after year the small proprietors are sinking deeper in the mire, their frantic struggles only serving to expedite their descent. It is in this extremity that Red Republicanism, and the plans of M. Cabet and M. Prudhomme find enthusiastic disciples. Social Utopias, in which the State is to fill every man's pockets, are ingeniously planned and rapturously received; and it is felt that, even should these brightly-hued bubbles burst, still the mighty effort of blowing them may produce a breaking-up of all the old social elements, in which the unburdened interest-payer flatters himself that his chance of keeping his estate is far better than his creditor's chance of preserving intact his claim upon it.

ON WEANING LAMBS.

The season for weaning lambs reminds us of the sad ignorance often displayed on this highly-important part of a farmer's proceedings. Too few sheep are often kept to afford the sole charge of a shepherd, and so to admit of the perfect division of labour; and, when even a shepherd is specially kept, he is, too often, ill acquainted with the duties of the office. They are generally ill educated—ill acquainted with animal physiology, and full of superstition. The farmer has to run the risk of employing persons, not who pay premiums for education in the branch of art they practise, but who are paid for attending to their duties, and, in the course of payment, catch just as much knowledge as will enable them to receive more pay from some one else, or from the same individual. This is a fact often lost sight of, in discussions on the wages of the labourer in husbandry, and in reflections on the capabilities of that class of men. A tradesman, a carpenter, a shoemaker, a tailor not only forgoes some four, five, six, or even seven years of service and pay, and gives a premium to be taught a trade; his tools cost him a considerable amount, and yet his *pay*, as a journeyman, is contrasted to disadvantage with the farm-labourer, both as to his wages and his qualifications.

But it is not always the servant to blame. The master does not, often, thoroughly understand the

principles of natural history as applied to these animals himself. The lamb for the first few weeks of its existence depends on the supply of food from its parent alone. It is the very source, and contains all the elements, half assimilated, of blood, of muscle, and of bone. At this stage the supply of the mother is often neglected. She is exposed to cold, and suffers hunger. The milk which nature drains from her system is exhausting her powers, and yet no shelter nor extra food is afforded. This is not the shepherd's fault, and he is not to blame if she dies, or sheds her wool, or becomes unfit to rear her young. A little corn, or cake, or artificial assistance would have strengthened the ewe and supplied the lamb with its full modicum of necessary food.

Soon as the lamb begins to eat, its auxiliary to nature's food is often ill attended to. A pasture as unsuited to lacteal purposes is selected for the mother, as it is improper to teach the offspring to feed, and thus prolong the dependence of the latter upon the former.

As the increase of vegetable food eaten by the lambs takes place, the supply and the use of the milk diminish. And if a peculiarity of constitution of the mother exists, or if any damage takes place to the udder, or if nature has been overtaxed soon after lambing time, she will go dry, despite the efforts of the lamb.

At this stage they are often depastured on over-eaten seeds. The bowels of the lamb are tender, and they can ill resist the purging effects of this improper pasture; and hence the shepherd often sees scour in the unweaned lambs, and applies the shears and medicine—but, they die. He has not discovered that the lamb is weaned, and has an improper pasture. It is with its mother, and he neither knows nor cares whether she has milk or not, and medicine and shears do not avail—his lambs—odd ones die of scour.

Nor at weaning time is a better provision made. The master does take care to put them in a somewhat worse pasture, in order to check the flow of milk, and so render the operation a less risking one to the dam; but, unless he is careful, he is increasing evil to the produce.

Once place weaned lambs in over-eaten seeds, and the whole flock takes the scour, followed by flies, and maggots, and medicine, and death.

Now, a hard old grass pasture, or a second crop of mown clover, will be perfectly safe. It is not the excellence of the pasture as regards its quantity which is to be feared, but the quality; for, if rich land, if gross newly-grown seeds, the scour is certain to follow. Some flock masters, who have not red clover, nor poor grass land, even send off their lambs to a poorer soil to graze, until their bowels have become accustomed to purely vegetable diet.

Should scour take place, it is often difficult to stop. The bowels must be relieved of the dried food, and the system hardened by tonics. A dose of a quarter-of-an-ounce of flour of sulphur in old milk will generally succeed in stopping the disease, if it be properly attacked in its early stages.

Another neglected circumstance in weaning lambs is the want of removing the mothers far away, so that they may not hear the bleating of their lambs. Humanity and interest alike require this precaution. The ewes should be taken to a cool plain and rather poor pasture, out of hearing of the lambs; otherwise, the excitement and agitation will do them considerable harm. They should the second day be all carefully examined. All with swollen udders should be milked; and it is no bad plan to wash the udders with cold water. The third day a similar process should take place throughout the whole flock. On the fifth day another and final examination may take place, when they will have forgot their lambs, their milk will be re-absorbed, and they will not appear to remember the loss of their offsprings, about which at the time they made such lamentations.

It is an excellent plan to have a few wethers or barren ewes to put in the field with the lambs after weaning. They teach them to select their food, they draw out the instincts of the young lambs, and materially assist in drawing and training. A pen should be provided in the corner of the field, and to dip as soon as possible after weaning is by no means a bad practice. — Gardeners' and Farmers' Journal.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

(Continued.)

May 12.—At the conclusion of Mr. Trimmer's Lecture already given to our readers, on the agricultural importance of a knowledge of the warp or drift forming the soils lying on different geological formations, Mr. Pusey, trustee, in the Chair, and after a vote of thanks moved by Lord Berners, and seconded by Sir John Johnstone, Bt., M.P., for Mr. Trimmer's kindness in preparing that valuable lecture, and his trouble in illustrating it with so interesting a series of original geological diagrams, the meeting was addressed by Lord Berners, Captain Wentworth Buller, Mr. Pusey, and Sir John Johnstone.

Clay-bank Draining.—Lord Berners, on rising to propose a vote of thanks to Mr. Trimmer for his interesting lecture then delivered to the members, remarked, that if he had understood the lecturer correctly, the furrows to which he had alluded in reference to draining, were the same as what in Leicestershire were commonly known as "clay-banks"; and if so, his Lordship could from long experience corroborate the accuracy of Mr. Trimmer's views on that subject. Lord Berners had found the only way to drain effectually and cheaply was to ascertain the direction of those banks; for, while a drain parallel to a clay-bank would not in some instances drain to an extent of more than two or three yards, one across the bank would be found to drain to 20, 50, or even a still greater number of yards; a fact of which he had proved the correctness by digging trial-holes in the fields. He found that in some spots of the strongest clays, there were, at various depths, little sand-galls, fissures, fibres, stones, or some porous substance; and that between these, in different intervals and directions, ran the strong clay-banks alluded to. It then became evident to his Lordship, that the best plan to adopt would be that of uniting these fissures by cutting directly across, and through the opposing clay-banks that formed the obstruction. When the fall was in more than one direction, it was also necessary to ascertain whether there was any other obstructing object, such as a hard pan or retentive subsoil, giving to the under or lower water a natural course, not down the steepest slopes of the hill, (in which direction, the land might at some remote date have been thrown into ridges); in such cases diagonal draining only having been found to be effectual. His Lordship added, that more water was frequently to be found in or under the slope of the ridges than in the furrows. In answer to a question then put to his Lordship by Mr. Darby, whether such drains would stand seven years, he remarked that he could show some drains put down on that principle twenty years ago, that still answered perfectly; while others placed on the old system, directly down the steepest part of the slope, had failed entirely. His Lordship could most strongly recommend the plan of trial-holes, both before the commencement of the work and during its progress, for the purpose of discovering, not only the relative depth of the lower or deep water in different parts of the field, but the depth also of the fibres, fissures, or porous spots, so frequently to be found in the strongest clays. By these means he had frequently and most efficiently drained heavy fields at one quarter the cost of labour that would have been incurred by the usual practice of draining at one uniform depth and width. The land on which his operations had been carried on in Leicestershire, consisted of a strong blue clay, that hardened on exposure.

Manure-deposits.—Captain Wentworth Buller, R.N., called the attention of the Council to the great results that would in all probability arise to the English farmer, from a careful habit of observation among our navigators, in reference to deposits on barren rocks, creeks, and islands throughout the world, especially in tropical regions. He laid on the table a section of the Admiralty Charts, on which were laid down on a large scale the eastern shore and the adjacent islands of the Pacific; and an American work entitled:—

"A Narrative of Four Voyages to the South Sea, North and South Pacific Ocean, Chinese Sea, Ethiopic and Southern Atlantic Ocean, Indian and Antarctic Ocean. From the year 1822 to 1831 (comprising Critical Surveys, Life, &c). By Capt. Benj. Morrell, jun. New York (Harper), 1832."

This work at the time of publication was sold in London, at 15s., by O. Rich, 12, Red Lion-square, but had now become so scarce that no copies of it were, he believed, to be met with. He hoped he should not be introducing a subject altogether foreign to that under discussion if he gave a practical illustration of the advantages which might be derived from this habit of observing the different deposits upon the face of the earth. Among these deposits, none were of greater importance to the agriculturist than those enormous deposits of guano which were now known to exist in different quarters of the globe, but which—for want of observation on the part of navigators and travellers—had so long escaped notice. The chart which he now produced was an admiralty chart, showing the track of the Beagle in 1836. On it were laid down the Islands of Lobos Afuera and Lobos de Tierra; still from this survey not a syllable was known of the enormous deposit of guano now proved to exist in these islands. This discovery was due to Captain Morrell, an American sealer, whose book of voyages he now produced. He thought it might be interesting to the Society to see the minute description of these islands given in this book with the account of the guano. He trusted that individual members of the Society, who knew so well the value of guano, would take the subject up, and see if they could not do something to put down or to mitigate the monopoly now claimed by the Peruvian Government. It could not be supposed that an individual like himself could contend with such a powerful monopoly unless supported by public opinion. He knew of no subject more useful and advantageous to the Society and to all practical men than that of cheapening guano. Captain Buller concluded his remarks by striking evidence connected with the discovery and long use of guano, the geographical localities of its occurrence, and his own official communications with the Foreign Office on the importance of a reduction being effected in its prices to the agriculturists of this country. Captain Buller's observations excited much interest in the meeting, and were received with full concurrence as to the importance of the question.

Superficial Deposits.—Mr. Pusey could bear witness to the priority of Mr. Trimmer's important views on superficial deposits, as brought under the notice of the Geological Society and the Royal Agricultural Society of England. He thought that great benefit would eventually result from these new views, in determining

more accurately the relation of geology to agriculture in its practical bearings.

GEOLOGICAL MAPPING OF ESTATES.—Sir John V. B. Johnstone, Bart., M.P., addressed to Mr. Pusey, in 1839, a letter containing the particulars of the geological map and survey of Sir John's Hackness estate, made for him by the late celebrated Dr. William Smith. This letter was published at the time in the first volume of the Society's *Journal*, and the following extracts from it will strongly illustrate the importance of the subject of Mr. Trimmer's lecture :—

In the year 1828, having observed great variations in the soils upon my estate, not only on the sides of the hills, which might have been expected, but also in the fields upon the tableland forming the summits of these hills, and which, from being flat, or rather declining to the south with a gradual and easy slope, rendered the variation more difficult to explain, I mentioned the subject to Dr. Smith, who was then lecturing at Scarborough, and surveying the surrounding district, with the view of proving the identity of the Hackness strata with those near Oxford. He at once offered a solution of my difficulty by a reference to geology; and, having gone over minutely the fields in question, with a reduced map of my estate in his hands, he marked upon it, in different colours, the ranges of these strata, as they exhibited themselves in succession upon the surface, forming themselves into zones or breadths of one, two, or more fields together, according as the particular stratum which came to the surface was more or less horizontal, or more or less thick. The result thus obtained clearly demonstrated that the value of each field, and the mode of cultivation already adopted (with the exception of the use of lime, which had been too frequently and too indiscriminately applied to the entire estate), corresponded to the variations of the strata, and were limited by the areas which these occupied on the surface; thus showing that (though the results had been arrived at by the farmers through a different process, viz., trial and error) the geological character of a country, when accurately understood, pointed out at once the natural value of the land, and the system of cultivation best adapted to it. For instance, on the highest range of my hills, a few fields, without any apparent reason, have been universally productive in all seasons, more so than the fields adjoining them on a lower level, and which appeared *nearly* of the same quality. The fossils, and other marks well understood by Dr. Smith, proved them to consist of an insulated portion of the UPPER calcareous grit formation, which also produces an excellent tract of land in another part of Yorkshire. Subsequent closer investigation by other geologists, and a discovery of some fresh fossils, makes me now think that the vein in question is upon the upper good bed of the *ordinary* calcareous grit, below the coralline oolite, and which does not appear elsewhere in the neighbourhood. Whichever formation, however, of the two it may belong to, the *peculiarity* remains the same. Both strata in other districts form good land. I have *now* no doubt whatever that the soils upon the calcareous grit formation always vary according as the particular beds of that stratum come uppermost. So also through all the successive divisions of the upper oolitic series, which compose this estate, it was seen that the best upland grass-land was on the peculiar zone or stratum formed on the coralline oolite through all the farms, though separated from each other by wide intervals. We also discovered what, when followed out in other districts, may prove a most valuable fact, that the wheat is usually only thrown out in severe frosts upon those fields formed by this same coralline oolite; the same cause having no effect upon the *adjoining fields*, which are on a different strata, lower in the series, and of a sandy nature, with no calcareous matter in them. A limestone road, as you know, lifts more in frost than a gravel road; and a different method of planting wheat upon chalk, or other calcareous soils, must be pursued than that usually adopted, if we wish to SECURE our wheat crops from failure from this particular cause. Next we found (as is the case over an extensive district here) that the entire surface of the portion as yet left out of cultivation upon the estate was formed by the worst beds of the calcareous grit, which (notwithstanding their name) contain no calcareous matter whatever. On analyzing three divisions of the calcareous grit rock at Scarborough, I find that the two upper beds are calcareous, the highest of the two in the greatest degree, probably from its vicinity to the coralline oolite, which immediately covers it; but a lower bed there, like that at Hackness, is entirely destitute of lime. This distinction should be followed out and tested in other districts, as we know that in many places the calcareous grit forms very good land; probably this arises from the calcareous beds being there uppermost. Again, when, on descending the hill-sides, it was found that there were certain fields which, whether towards the south or north, whatever the aspect, whatever the local circumstances (so long as not too steep to be ploughed), invariably produced good wheat, it was a triumph for agricultural geology to discover that these fields were invariably upon the Oxford clay, or rather where the lower beds of the calc grit become mixed up with that formation; and, comparing the comparative value and growth of timber produced upon different portions of the slopes where too steep for ploughing, it was satisfactorily established that oaks flourished the best upon this identical stratum or zone wherever existing. It also appeared on examination that the lowest bed of this same Oxford clay was the only water-tight stratified bed on the estate, and threw out every spring on the hill sides—a fact which, had it been known some years ago, coupled with the knowledge we now possess of the thickness of the superincumbent strata, would have saved much money expended in sinking for wells upon the highest range of these hills. The facility with which water had been obtained by shallow wells on a *neighbouring summit* had probably misled the then managers of the estate. Dr. Smith discovered that the height last named was covered with diluvium, which had a water-tight seam in it below the gravel, a few feet below the surface, and thus produced the well or spring. In this case, geological knowledge would have shown at once the different construction of the two hills. It is a curious fact that the greatest mass of diluvial matter upon the estate should be on one of the *highest summit* levels; thus giving water at an easy depth, and forming a tract of good grass land. I may therefore fairly say, that the geological map and survey of my estate (which I allow is peculiarly adapted for such an experiment, through the variety and number of the subdivisions of the oolitic series which develop themselves successively upon the surface) has not only explained the reason of the discrepancy between the soil and productiveness of neighbouring fields—a matter of great interest, and tending to develop the true conditions of vegetable life—but that the following positive practical results will also have been derived from it:—1st. The knowledge of applying lime to *advantage* over the property. 2nd. Laying down fields to *advantage* to grass, and where and how to plant wheat. 3rd. What sorts of trees to plant upon each stratum. It is moreover important to possess a sort of theory of the whole series of soils, which explains many of their peculiarities, and furnishes hints for future agricultural operations. I have before observed that the best grass land upon the hills is upon the coralline oolitic beds. My geological map at once points out all those portions of the estate which consist of this stratum, and upon which there is obviously no necessity for lime; and I am thus saved from the task which otherwise I should have to encounter of analyzing the soil of each individual field. The above are a few of the more striking results which have followed from the geological survey of my estate, and may perhaps serve to show that, by pursuing a similar system over different districts of our island, the knowledge of the regular stratification of the earth may be made subservient to the systematic arrangement of those facts, trials, and experiments which societies like this will encourage and collect. It is quite clear that the results of the best local practice on different soils have never yet been generalised, nor even had the benefit of a judicious selection. Certain soils are so obviously connected with their bases, that we need scarcely ask how geology and agriculture are linked together; and to use Dr. Smith's own words, "The strata succeed each other in a certain order, and, being delineated, a knowledge of the strata becomes the natural and safe foundation of improvement; and if agricultural chemistry be ever successfully applied to the practical purposes of agriculture, it must be by proceeding with the chemical analysis of soils along the range of each stratum." Proceeding then on the positive basis established by the science of geology, we may spread on that base a new layer of facts, with ready references to them for local use or general reasoning. Arranged upon maps they may be

readily seen, compared, and generalised. When any two parties have made experiments upon the same stratum, no matter which, a comparison can then be made. Chemists will thus be called into action, and as the different limestone, soils, and clays, &c., vary, so in lieu of the general terms sandy, loamy, or clayey, which are only generic distinctions of little use, specific distinctions derived from geological terms will hereafter be used.

At the present meeting, Sir John Johnstone confirmed by further experience his full estimation of the value of *detailed* maps of estates, in reference to the connexion of their geological and agricultural characters, and the great practical importance of the subject. He felt a great desire that the opportunity of Mr. Trimmer's immediate attention to illustrations of this nature should be rendered available to an extended prosecution of his researches and elucidations—the operations thus undertaken by him professionally being so far a question of expense as to save him from loss by the requisite outlay, while he liberally gives up his time and services to their prosecution. Having consulted Mr. Trimmer on this point, the following arrangements had been proposed by Mr. Trimmer :—

Wilmington, near Dartford, Kent,
May 18, 1852.

I have so much confidence in the value of the plan which I propose for laying down on one map the variations of soil and subsoil, and am so anxious to have it brought to the test of experiment, that if any landowner can be induced to have 1000 acres mapped on my plan as a specimen, I shall be happy to undertake it on the following terms :—

1. If there is no private map of the estate from which a trace can be taken for the field, he shall procure one from the Tithe Office, for which they will charge 1d. the acre.

2. He shall pay for the paper for the fair copy; and, if I find it necessary to employ a draughtsman to make it, he shall pay the draughtsman. These two items may come to about 4d. the acre.

3. He shall allow me two men for a few weeks, to open holes where I require it, and to fill them in again.

4. I will give my time to the work gratuitously.

5. I shall be permitted to exhibit the map, and to explain the results obtained, at the Royal Agricultural Society of England, the Geological Society, the Society of Arts, and the British Association for the Advancement of Science.

(Signed) JOSHUA TRIMMER.

Sir John Johnstone hoped that some opportunity would be afforded for the engagement of Mr. Trimmer's valuable services and matured scientific experience in a work of so interesting and practical character as the one now proposed.

A WEEKLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday the 19th of May, Colonel Challoner, Trustee, in the Chair. Professor Way, the Consulting-Chemist to the Society, delivered before the Members the first of his proposed lectures on the light thrown by the agricultural principles of the celebrated Jethro Tull on facts connected with modern cultivation.

Prof. WAY stated that his object in the present lectures was to call attention to the principles enunciated by Jethro Tull fully a century ago, and to make such quotations from his work as would seem most forcibly to illustrate his views and the arguments by which they were supported. In doing so Mr. Way wished it clearly to be understood that he was not advocating any system or practice founded upon those principles, but simply of pointing out how far the ideas of an author who wrote almost before the dawn of modern chemical science, were compatible with the facts and laws which have been since recognized and established. As might be anticipated, wherever Tull attempted any scientific explanation of facts, the terms he employed were antiquated and obsolete—in accordance with the vague and fanciful theories of the older chemists and physiologists, but utterly inconsistent with the present state of these sciences. Still, in the midst of all these crudities there might be seen a large amount of philosophical reasoning; and those who carefully studied the writings of Tull would find that many of the discoveries in agricultural science which are accorded to philosophers of the present day, were more or less clearly anticipated and announced by the author in question. Cobbett, to whom we are indebted for the most convenient edition of Tull's book, takes occasion in his preface to pay a deserved compliment to the excellence of its contents, and to remark that the re-publication of the work would strip many modern agricultural writers of their borrowed plumage. The great principle of Tull was, that the soil and the air together contained all that was necessary, without the aid of manure, for the production of luxuriant vegetation; but that, in order to render the one and the other available for this end, it was necessary that the soil should be opened up by abundant pulverization and comminution of its parts.

The arguments with which this view was sustained were most forcible and convincing. The better to illustrate his meaning, he had compared the parts of the earth to which the roots of plants attach themselves with the grass or herbage on which animals feed. Thus the fissures or openings through which the roots penetrate, and the internal surface upon which they spread their delicate fibres, constitute, in Tull's language, the "pasture of plants"—a most happy expression, and one which facilitates in the mind the comprehension of his subsequent reasonings. So, then, as an animal will grow and fatten in proportion to the suitability in quality and sufficiency in quantity of the food to which it has access, in the same manner the rapidity of growth and the luxuriance of a plant will depend upon the nature and abundance of the "pasture" provided for it in the recesses of the soil. But the pasture of plants differs from that of animals in this important respect—that whilst in the latter case the quantity can only be increased by taking in more surface, the pasture of plants may be indefinitely extended and renewed by the pulverization of the soil, which is constantly exposing new surfaces to the roots. Nothing can be more true, as Tull says, than that for all practical purposes the soil is infinitely divisible; and that since the roots of plants cannot by possibility occupy every interstice which may exist in a highly comminuted soil, each additional stirring is tantamount to the production of a new internal surface, and a fresh source of food. Then he argues that constant comminution and opening of the soil not only enables the roots of plants to benefit by the stores of food already existing in the soil, but that it at the same time materially increases that stock by letting in the atmosphere loaded with invigorating and healthful supplies. It is obvious that Tull could have had only a faint notion of the changes in the nature of the soil which might be brought about by the influence of the air, and we can imagine the pleasure which he would have derived from the acquisition of the more exact knowledge which in relation to this point we now possess; but none the less was he convinced that such an influence was exerted, and one of the objects of his method of cultivation was to take full advantage of it. Acting upon these principles, Tull had introduced a system of cultivation of crops planted in rows by the drill, and had earned thereby the gratitude of posterity, which was exhibited in the almost universal adoption of that system. But he had also attempted a method of growing crops which had not been so generally followed. In addition to the provision for stirring the soil between

the rows of plants, he had left intervals of varying but very considerable width, between every second or third row, which enabled him at all times of the year to carry out his principle of pulverizing the soil. These intervals were in fact in the position of a naked fallow for the year, and were, in the succeeding season, in their turn brought under a crop. Mr. Way did not intend to enlarge upon the practical part of this subject, which many of his hearers understood far better than himself; but he wished, irrespectively of any particular form of accomplishing that end, to impress upon them the great importance and value of a thorough comminution of the soil, both as rendering available its present riches and enabling it to receive from the air whatever beneficial effects the latter was able to produce. Mr. Way read a number of passages from the author's work, commenting upon and explaining them as he proceeded, and concluded his lecture by commending the book to the careful study of all those who had not yet become acquainted with it.

Lord Berners had great pleasure in proposing a vote of thanks to Prof. Way for the interesting lecture he had then delivered, which would be useful in pointing out to practical men the causes of their success or failure in particular cases. Every farmer knew that the clay placed below a manure-heap increased its value and quantity. There was no description of land that was not benefited by green crops. He had some land so foul, that he had ploughed down the mangold on it, and found the wide spaces yield from 9 to 15 tons per acre. He had more wheat on strong land than on simple fallows.—Mr. Rowlandson had never greater pleasure in his life than in seconding the vote of thanks for the lecture they had just heard, and which he considered did great credit to Prof. Way, and proved the practical uses of funds appropriated by the Society to scientific purposes. He had himself been engaged in chemical operations on a large scale, and he could particularly estimate the value of one of the facts adduced, which would revolutionize the plan of processes connected with it, namely, the constitution of the double silicates, and the superiority of lime as an active convertible agent. It would have been thought, under the old system, that the soda-compound was superior. He conceived that the theory of Prof. Way would open views of unexampled importance in reference to the promotion of fertility in soils. It was probable that, if the double silicates could be obtained economically, direct manuring with the double silicate of lime might eventually be adopted as preferable to marling and liming. He remarked that the double silicate of alumina and lime formed a considerable portion of hydraulic cement, and might probably be manufactured on a large scale.—Colonel Challoner thought that these lectures, as delivered by Prof. Way, did a great deal to establish that intelligent principle of farming which led at every step to the inquiry "Why" such and such things should be done by him. He considered that the Council had acted very wisely in their arrangements for the lectures to be delivered from time to time before the Members of the Society.—Mr. Evelyn Denison, M.P., inquired the condition of pulverized and burnt soils, and the power of the latter to absorb ammonia.—Prof. Way remarked that, although by burning soils their staple was destroyed, such soils were improved by the resulting pulverisation. Clay was mechanically improved by being burnt, but it could then only absorb ammonia mechanically as a porous substance, the hydrated double silicates having lost by heat their properties of absorbing that alkali, and clay, when burnt, was accordingly deprived of the power of chemical absorption dependent simply on the action of those silicates.—Mr. Chandos Wren Hoskyns then gave an interesting account of his personal visit to the crops of the Rev. S. Smith, of Lois-Weedon Vicarage, in Northampton, the best exponent, as Prof. Way had just then described him, of the Tullian system of cultivation, and the author of a paper "on the experiment and experience of the growth of wheat year after year on the same acre of land," in the last volume of the Society's Journal, page 133. His results, as Mr. Hoskyns remarked, were only so wonderful, that they did not receive the credit they deserved; although, when personally inspected, they carried at once a conviction of their perfect feasibility, notwithstanding the marvellous absence of all manure, as technically so understood by such term in the carrying out of his simple, but effective processes.—Mr. Gadesden could fully confirm Mr. Hoskyns's statement, as he had also paid a personal visit to Mr. Smith's farm and inspected his crops. The soil was a stiff one, and so stiff, that Mr. Smith's own tenant farmer expostulated with him in reference to the circumstance; but, although no manure had been used, it had become so fertile, that it would be necessary to cast off the top staple and bring up the clay. Mr. Smith had 6 acres of wheat, and intended to extend the cultivation to 20. He understood, too, that the Earl of Essex had 50 acres on the same system.—Mr. John Mainwaring Paine, of Farnham, could simply, but entirely confirm all that Mr. Hoskyns had stated with regard to Mr. Smith's experimental wheat-fields, under the Tullian mode of culture as practised by him. He would, however, very briefly state what he saw, and the impression which Mr. Smith's crops left on his own mind. The first time that he saw them was immediately after inspecting Mr. Lawes's experimental wheat at Rothamsted, about the last day of June. He had thus a good opportunity of forming a comparison of the appearance of the respective crops at that time. Mr. Lawes's highly manured nitrogenous plots were then looking splendidly well: Mr. Paine had also some of his own similarly manured, which was likewise very promising, and which did realize from 7 to 7½ quarters per acre. He had thus in his mind's eye some very good standards of comparison, and he was bound to state that Mr. Smith's far exceeded either of them in luxuriant appearance and promise of crop. When he first beheld them, he could not help exclaiming, "This land has been lavishly dressed with ammoniacal manure." And so, indeed, it really had been, from atmospherical sources; for this we knew, and could appreciate, after Mr. Way's most valuable discovery of the absorption and retentive powers of clay soils. Mr. Paine felt assured that there could be no mistake about this matter. The nitrogenous aspect of the whole crop, in his opinion, stood out in too bold relief to be overlooked for a moment. He was also particularly struck with the largeness and regularity in size of the ears of the corn, and with the uniform height of the straw. This he did not expect to find; yet such, he remarked, was the fact. On asking Mr. Smith to explain the cause of this remarkable feature in thin-sown wheat, he replied that he believed it simply to arise from the circumstance of early sowing, by which means the plants were enabled to tiller out before the spring. These appearances, and the subsequent large crop obtained by Mr. Smith, Mr. Paine need scarcely state, after what Mr. Smith had explained fully in his pamphlet as obtained exclusively by deep and frequent stirrings of the soil. His method was founded on Tull's principles, and was a great improvement on Tull's practice. Mr. Smith's intervals are smaller; there are three rows instead of two, and he digs down deeply into the subsoil, which Tull was afraid to touch. Mr. Paine considered Mr. Smith's practice to afford a most beautiful illustration of the large amount of ammonia available for agricultural purposes existing in the atmosphere, and at the same time of the absorptive

power of clay or loamy soils. He had seen Mr. Smith's crops again this season: they were as remarkable for their luxuriance as last year, probably more so. There was no sign of exhaustion in the field then cropped with its seventh successive growth of wheat; but, on the contrary, there was some danger to be apprehended from its exuberance. There was evidently an accumulation of atmospherical and disintegrated mineral manure in that field, for an explanation of which Mr. Paine thought we must fall back upon the information Mr. Way had given us relative to the absorption, retention, expenditure, and consequent balance of manure left in the soil. Mr. Paine could perceive nothing peculiar in the geological structure of the land at Lois-Weedon which would lead us to infer that Mr. Smith's success was at all attributable to that cause. It was manifestly what would be good wheat land, when well drained and well cultivated. With common management, the surrounding land did not produce large crops. In fact, Mr. Paine remarked, it was well known, that many trials of the same plan were then proceeding elsewhere, in different counties, with every probability of similar success wherever the land possessed the necessary ingredients of clay or loam. At that time he was himself carrying out this system on one of his fields; the surface soil of which was an extremely stiff clay resting upon a subsoil of the lower chalk marl; he having selected the field in question because it had already borne three wheat crops in the four preceding years. It was sown with wheat in the winter preceding 1848, the land being at that time in a good state of cultivation, the crop was an extraordinary fine one till it fell, and then it only produced about six quarters of bad quality per acre. It was sown in 1849 with wheat, again without any manure; the result was 5½ quarters of good wheat per acre: all through the season the flag and straw had a very light green appearance, evidently showing the want of ammonia. There was clover in 1850 cut twice, and without any manure; and in 1851 it was again sown with wheat and manured with guano. The result was a crop of upwards of seven quarters per acre, weighing 65lbs. per bushel. Immediately after last harvest the field was deeply ploughed and cleaned from weeds, in preparation for Mr. Smith's plan; but for want of the requisite implements it was not sown till the 9th of November, at the rate of half-bushel per acre, without any kind of manure: it looked thin and miserable through the winter, so that the intervals could not be trenched up till the middle of March. The ground was then broken eighteen inches deep, and some of the subsoil brought to the surface. The rows of wheat have been hoed, and the intervals deeply stirred up to the present time. The whole field had at that time a most luxuriant appearance, the flags of a dark green colour, and, like Mr. Smith's, if there be any fault, Mr. Paine's crop was only looking too gross in condition than otherwise.—Mr. Denison, M.P., inquired as to the levelness of all the ears of wheat in these cases, and referred to the objection sometimes made that when wheat tillered much many of the ears never attained perfection.—Mr. Alcock, M.P., required a statement of the profit and loss on this plan of cultivation.—Mr. Briscoe referred to its connexion with spade husbandry.—The Earl of Essex remarked that all his work was done by the spade, and no difficulty was experienced.—Mr. Wolryche Whitmore stated the results of his own experience in deep cultivation on his estate in Shropshire. The effects of trenching a piece of garden ground three feet deep, and leaving it without manure, were so wonderful, that strangers on witnessing these effects could scarcely be persuaded that the ground had not been heavily manured. A portion of the arable land too, on one of his farms, was ploughed twelve inches deep, and the remainder was only ploughed shallow: the result was, that while the deep-ploughed land was most luxuriant, the shallow was so indifferent that he did not know what to do with it. He then cited the results of Mr. Woodward's farming in the Vale of Evesham, and Mr. Randall's opinion that dry ground should be well trodden with horses in the early spring. They were all well acquainted with the pulverizing and consolidating power of Crosskill's clod-crusher: still he thought that a medium should be observed in these operations, and that pulverization especially should not be carried too far; the market-gardeners, he believed, having ceased to pass their soil as formerly through a fine sieve.—Mr. Chandos Pole recollected an instance on his own property of the result of great consolidation from trampling. In the November of 1850 the whole of a pack of hounds had run through the same gateway of a wheat-field. The soil at Radbourne, as those would remember who were present at the trial of implements at the Society's Derby Meeting, is a remarkably strong one, and the ground near the gateway in the line of these runs was trodden down as hard as a table: it was thought, accordingly, that the wheat would fail in this part of the field; but on the contrary, it was found before reaping that it had become the best part of the whole crop.—Mr. Whitmore remarked that he had gone to twelve inches deep.—Mr. Paine stated that he had proceeded to twenty inches, and had found that the deeper he went the better crops he obtained.—Colonel Challoner referred to the different mechanical condition acquired by the particles of soil in the process of sifting.—Professor Way thought nobody could doubt the value of consolidation after pulverization. In these, as in all other cases, no truths could militate against each other, while errors might. The lighter soils were those to which consolidation was most applicable; heavy soils required pulverization before consolidation. Mr. Smith, he believed preferred a solid bottom to his land. Perfect manuring was obtained from the air: in fact, that clay itself manured itself.

The vote of thanks to Professor Way for his kindness in delivering the interesting and important lecture which they had then heard, was then put by Colonel Challoner from the Chair, and carried unanimously; Professor Way, in acknowledging the compliment, expressing the satisfaction it gave him on that and on all other occasions to aid in the great work of promoting the objects of the Society.

The Audit of Accounts was held on Friday the 21st of May. The Earl of Ducie, President; Mr. Raymond Barker, Chairman of the Finance Committee; Colonel Challoner and Mr. H. Blanshard, Members of the Finance Committee; and Mr. Thomas Knight, Mr. George J. Raymond Barker, and Mr. George Dyer, Auditors on the part of the Society; were present.

The Accounts of the Society from July to December, 1851, were examined, audited, and found correct.—The Bankers' Letter and Transfer Receipt relating to the purchase of Stock in the 3¼ per Cents. for £1,010, were laid before the Auditors.

A Special Council, for deciding on the Report to be made by the Council to the ensuing General Meeting of the Society, was held on Friday the 21st of May, the Earl of Ducie, President, in the Chair. On the motion of Col. Challoner, seconded by Mr. Raymond Barker, the Report was taken into consideration and agreed to accordingly.

The half-yearly General Meeting of the Society was held at the Society's House in Hanover-square on Saturday the 22nd of May, The Earl of Ducie, President, in the Chair. We have already laid before our readers a report of the proceedings at this Meeting.

A Monthly Council was held at the Society's House in Hanover-square, on Wednesday the 2nd of June. The following Members of Council and Governors of the Society were present: Lord Portman, Trustee, in the Chair; Sir John V. Shelley, Bart., Sir Charles Lemon, Bart., M.P., Sir Robert Price, Bart, M.P., Mr. Raymond Barker (Hambleden), Mr. Raymond Barker (Fairford), Mr. S. Bennett, Mr. Ivatt Briscoe, Captain Wentworth Buller, R.N., Mr. Burke, Mr. W. G. Cavendish, M.P., Colonel Challoner, Mr. Freeland, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Jonas, Rev. C. E. R. Keene, Mr. Kinder, Mr. Lawes, Colonel Le Couteur, Mr. Shaw, Prof. Simonds, Mr. Simpson, Mr. Slaney, M.P., and Mr. Crompton Stansfield, M.P.

Humphris W. Freeland, Esq., of The Albany, London, was elected a Governor of the Society.

The following new Members were elected:

James, Richard, Haverfordwest, Pembrokeshire.
Ludlam, William, Bradford, Yorkshire.
Bishop, John, Norwich.
Bennett, Henry, London-road, Liverpool.
Farley, Rev. C. T., Eastham, Tenbury, Worcestershire.
Westhead, J. P. B., M.P., Lea Castle, Kidderminster.
Taylor, George Edward, Oatlands, Leeds.
Filder, John, Mead's House, Eastbourne, Sussex.
Howard, Hon. C. W. G., M.P., Naworth Castle, Cumberland.
Read, James, Whittlesea, Cambridgeshire.
Macnamara, Arthur, Caddington Hall, Herts.
Locock, Charles, M.D., Hertford-street, May-fair.
Bermingham, Thomas, J. P. for the Co. of Galway.
Curme, Charles, Arlington-square, Islington.
Goulton, Benjamin, Gedney Dyke, Long-Sutton, Lincolnshire.
Bunny, Edward John, Christ Church, Oxford.
Harrington, Earl of, Elvaston Castle, Derbyshire.
Blandford, Henry, Sandridge Cottage, Melksham, Wilts.
Busby, William, Newton-le-Willows, Bedale, Yorkshire.
Newman, Thomas, Craysmarsh Farm, Melksham.
Smith, G. P., Oundle, Northamptonshire.
Jones, Henry P., 28, Mark-lane, London.
Buller, Morton Edward, Dilhorne, Cheadle, Staffs.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the monthly report on the accounts of the Society; from which it appeared that the current cash-balance in the hands of the bankers was £3,022.

President-Elect.—Lord Ashburton, having been elected by the members of the Society at their recent general meeting the President of the Society for the year ensuing the rising of the Lewes meeting, addressed a letter to the Council expressing his regret that the state of his health would oblige him to leave England for the German Spa during the autumn of this year, and thus prevent him from occupying, as it would otherwise have been his Lordship's pleasure and duty to have done, the vice-chair at the Pavilion Dinner at the ensuing Country Meeting, and from presiding at the general meeting and Council to be held on the following day in the County Hall at Lewes. He hoped, on his return to England, to devote himself to the duties of the high office to which he had been thus unanimously elected by the Society.

Lewes Meeting.—Sir John Villiers Shelley, Bart., presented to the Council the Report of the General Lewes Committee, of which he was the Vice-Chairman, detailing the satisfactory progress of the arrangements for the Lewes Meeting. This report was received and adopted accordingly.

District for 1856.—Mr. Raymond Barker presented to the Council the Report of the Special Committee appointed at a former Council to consider the District four years in advance, to supply the place of the South-Eastern District of the current year; and their recommendation that the District of the Country Meeting of the Society, for the year 1856, should comprise the counties of Huntingdon, Cambridge, Bedford, Buckingham, Hertford, and Essex.

Gloucester Meeting.—The agreement between the Mayor of Gloucester and the Secretary of the Society was laid before the Council, and executed in duplicate under the Great Seal of the Society and the powers of the Charter.

The following letter, from Mr. Saunders, of Worcester, dated the 22nd of May last, and addressed to the Secretary, was received with much satisfaction by the Council, who ordered their best thanks to be expressed for it, to Mr. Saunders and the Worcester Committee:—

"I am directed by the Committee appointed for promoting the holding of the meeting of the Royal Agricultural Society in 1853 at Worcester, to acknowledge the receipt of your letter of the 5th inst., and, in reply, to express the regret of the Committee at the unsuccessful result of their application to the Council. The Committee desire me to express their hope that the Council of the Royal Agricultural Society will, upon some early future occasion, take into their consideration the very strong claims of this city for the holding of a Meeting of the Society in Worcester. The Committee assure the Council that the cordial aid of the residents in this city and neighbourhood will not be wanting to ensure the success of the meeting at Gloucester."

Fines for Non-Exhibition.—The Secretary laid before the Council the following general Report on the Fines incurred by parties who had entered live-stock for the Windsor Meeting, and caused the Society to incur the expence of providing accommodation for their animals; which were eventually, however, not sent to the Meeting. The Council having excused two parties who had sent notice before the day of meeting, that in one case a pig had died on the railway, and in the other that the servant specially accustomed to the management of a stallion to be exhibited had met with a severe accident, the following was the detail connected with the remaining parties, on whom the claim of fine was made, and who had sent no notice whatever before the day of meeting of their intention to withhold any of their stock from exhibition. These parties were 47 in number, of whom 21 paid the fine on the Secretary's first application. The other 26, who did not comply with the rule of the Society, were written to a second time, when 12 of them paid. The remaining 13 were addressed by the Secretary for the third time, when nine of them paid. There was then left a final residue of 5 persons who failed to make the required payment, and whose names were handed over, by the unanimous order of the Council, to Messrs. Tooke, Son, and Hallowes, solicitors, of Bedford-row. In consequence of the legal representations thus made to them on this final reference, the whole of the parties liable to the fines in question, with the exception of the two parties only who had been excused on the special grounds referred to, made the payments required of them, the object of the Council in this enforcement of the rules of the Society having been the establishment of a principle of impartial justice in their proceedings, rather than the mere recovery of the small sums of which these fines consisted.

Prize Essays.—Mr. Pusey, M.P., Chairman of the Journal Committee, transmitted to the Council the following adjudication of a Prize in this department:

To John Wilson (late Principal of the Royal Agricultural College, Cirencester), of Heath Lodge, Iver, Buckinghamshire, the Society's Prize of Thirty Sovereigns, for the best account of the Manufacture of Sugar from Beet-root, which should include the following information: 1. The cultivation of the Root for this purpose in France, Belgium, or Germany; and the extent

to which high manuring affects its saccharine contents. 2. Whether Mangold-wurzel is applicable to the manufacture of Sugar? 3. Manufacture of Sugar according to the latest improved processes. 4. Disposal of the refuse for the distillation of spirits, extraction of salts, or feeding of cattle. 5. Comparison of profit per acre from production of sugar or corn at present prices.

PRIZES FOR ESSAYS AND REPORTS.—Lord Portman laid before the Council the following Schedule of Prizes for the ensuing year in the department of Essays and Reports—

Farming of Herefordshire.....	£50
Farming of Surrey.....	50
Farming of Derbyshire.....	50
Heavy Land Farming	30
Light Land Farming.....	30
Cultivation of Beans and Peas.....	10
Hereditary Diseases in the Sheep and Pig.....	20
Any other Agricultural subject.....	20
	£260

This schedule was adopted by the Council, subject to the usual conditions of competition, and the delivery of the essays and reports at the House of the Society on or before the 1st of March, 1853.

DEPUTATION ON GUANO.—On the motion of Mr. Fisher Hobbs, seconded by Mr. Shaw, the following resolutions were carried—

1. That a Deputation to the Minister be appointed to represent the importance of taking every possible means to effect a reduction in the price of Guano.
2. That it consist of such Members of the Council and of the Society as may think fit to attend.
3. That the Secretary communicate to the President, and request a day of interview with the Premier, and communicate to the Society.
4. That a copy of these resolutions be sent to the Duke of Richmond.

POTATO DISEASE.—The Earl of Malmesbury, H. M. Principal Secretary of State for the Foreign Department, transmitted to the Council, through Mr. Addington, the following dispatch addressed to his Lordship by H. B. M. Consul-General at Warsaw—

Warsaw, "May 13th, 1852.

"Although the kingdom of Poland has suffered comparatively very little from the blight of the potato plant, which has of late years been so general in the more western countries of Europe, everything relating to that still unexplained phenomenon has nevertheless received much attention here from private individuals as well as from the public authorities. With the exception of Ireland, there is, perhaps, not another country in which the culture of the potato forms so important a feature of the rural economy of the nation as it does in Poland, although its introduction into this country is of comparatively recent date; and much public attention has lately been excited here by an article extracted from a foreign provincial newspaper, ascribing the so-called 'potato disease' to the presence of too much *free* ammonia in the lands on which the plants are cultivated; and pointing out the very simple means of counteracting this evil by the employment of fixed alkalies. This theory appears so strongly to bear out the view which was taken here of the subject at the very beginning of the epidemic appearance of the evil in question (as reported in my letter consular, No. 28, of the 16th October, 1846), that I am induced to bring the statement to your Lordship's notice, for the information of such persons as may be specially interested in ascertaining the correctness of the observation. I have not seen the original statement; but the article above alluded to mentions that it is copied from the 'Kölnische Zeitung,' to which it had been communicated by a Dr. Voget, of Heimsberg, in the Governmental District of Aix-la-Chapelle. Dr. Voget recommends as the most simple mode of decomposing the free ammonia, wherever by chemical tests it may be proved to exist, and whether arising from artificial manures or from natural causes inherent in the quality of the soil, to use crude gypsum as a top-dressing, or to irrigate the ground with very strongly diluted muriatic or sulphuric acid, in the same manner as liquid manures are applied, or before carrying out the manure to mix it with gypsum, ashes, or acids, &c.

"(Signed) GUST. DU PLAT,
"H. M. Con.-Gen. in Poland."

The Council ordered their best thanks to be conveyed to the Earl of Malmesbury for the favour of this communication.

A WEEKLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 9th of June, Mr. Raymond Barker, Vice-President, in the Chair. Professor Way, the Consulting Chemist to the Society, delivered his concluding Lecture on the agricultural principles of Jethro Tull, illustrated by modern facts.

Prof. Way's object in this second and concluding lecture was to examine how far the views and principles of Tull were consistent with the modern discoveries of agricultural chemistry. Plants consisted of certain organic and mineral elements, the nature of which was now well understood. The question was, could these substances be supplied by the air and by the soil without manure, as Tull supposed? It was pretty generally conceded at the present day that carbonic acid, ammonia, and water, together, were capable of furnishing all that was necessary to build up the organic structure of plants; whilst no soil of ordinary fertility would be found, upon examination, to be absolutely deficient in any of the mineral ingredients that were required by vegetation. The air contained both ammonia and carbonic acid, but it might be open to question whether in sufficient quantity not merely for a *natural* but for a *forced* production of wheat and other crops, such as alone would suffice for the wants of a populous community like that of this country. The quantity of carbonic acid in the air had been found by repeated experiments of M. Saufeure to amount, on the average, to a thousandth part of its weight, and Liebig had calculated that at any one time there was in the air as much carbon in this invisible form as would suffice for the production of the whole coal fields existing throughout the world. It required no stretch of the imagination, therefore, to suppose that with the air constantly in motion, and constantly renewed to the roots of plants, they might receive from this source all the carbon which was required for their growth. Whilst, too, every disintegration of the soil gave access to this carbonic acid in larger quantity for the direct supply of food, indirectly it contributed to the sustenance of plants by rendering available the necessary mineral elements of their food, which water impregnated with carbonic acid was capable of dissolving. With regard to the quantity of ammonia in the air, we did not possess such satisfactory information. Of its existence there, no one entertained a doubt; it was produced by the decay of animal and vegetable bodies, given off in the exhalations of living animal bodies, and probably in the sweet perfumes of flowers, and thrown out in certain parts of the world in immense quantities by volcanoes. But to ascertain the proportion of ammonia in the air was extremely difficult, and although it had been attempted by more than one able experimenter, the results must only be looked upon as distant approximations to the truth. Fresenius, to whom the most careful experiments on record in regard to this matter are due, found that 1,000,000 parts by weight of air contained 0.133 parts of ammonia. Without stopping to examine the probability of these figures representing the average amount of ammonia in the air, we might ask whether such a quantity would suffice for the wants of an abundant vegetation. This question it was impossible to answer. Mr. Way's own recent investigations had brought to light the existence

in the soil of certain double silicates possessing the power of abstracting the carbonate of ammonia from the air with as much avidity as if they were strong acids. A good soil, well opened by cultivation, would therefore be constantly at work, day and night, collecting ammonia from the air; and the quantity that could be so obtained would only be limited by the frequency of the renewal of the air. Of course we could not say how often this would take place; but what with alternations of temperature, differences in the heat of the soil and the air, the influences of wind, and perhaps also a constant interchange in the particles of air themselves, it was evident that the renewal of the air in the soil, and the consequent acquisition by it of ammonia, might go on to a very great extent. And it was worthy of remark, too, that this collection of ammonia by the soil was quite independent of rain and dews, and was always proceeding. The more, therefore, the soil was exposed to the air the richer it would become. Of course Mr. Way spoke of soils containing a sufficient quantity of clay. Some light soils there might be that would be injured, not benefited, by such exposure. Mr. Way went on to speak of the experiments of the Rev. Mr. Smith, at Lois Weedon, expressing the great gratification which he had experienced from a visit to that place. These crops of wheat, which were now growing on land which had been for six years under wheat without manure of any kind, looked as if they had received a dressing of ammoniacal salts: and that, indeed, was the fact, though the ammonia had been added not *directly*, but *indirectly*, *and from the air*, by the abundant cultivation which Mr. Smith's method enabled him to give. Mr. Way was of opinion, then, that, so far as the organic elements of vegetation were concerned, there was no absolute impossibility, but, on the other hand, every probability, that they might be secured in all abundance for large crops without manure, provided that the soil was fully exposed to the influence of the air. The only question that remained was in regard to the exhaustion of mineral matters by this mode of cropping. Mr. Way believed that the danger of mineral exhaustion in soils was frequently very greatly overrated. There was no doubt that the continuous cropping by wheat, or any other plant, without the return of anything in the shape of manure, would gradually but certainly reduce the quantity of mineral matter contained in the soil; but the quantities so removed were now accurately known, and it would be found that a continuous course of cropping by wheat for many years took from the land only a very insignificant quantity of these substances. The following table showed the amount of phosphoric acid, potash, &c., removed by a large crop of wheat in one and twenty years respectively, and in another column of the table would be found the *per centage* composition which the soil must have to yield them for twenty such crops.

35 BUSHELS OF WHEAT AND 2 TONS OF STRAW.

	1 crop.	20 crops.	Per-centage removed from soil by 20 crops.
	lbs.	lbs.	
Silica	171	3,420	0·152
Phosp. acid	30	600	0·027
Sulph. acid	8	160	0·007
Lime.....	16	320	0·014
Magnesia..	10	200	0·009
Potash	39	780	0·036
Soda.....	3	60	0·003
	277	5,540	0·248

The per-centage removed from soil by 20 crops, is calculated on the assumption that the soil is 10 inches deep and weighs 1,000 tons.

Those who had had anything to do with the analysis of soils would see that no soil of ordinary fertility would be found without a small quantity of those minerals here mentioned—indeed, it is usually the case that a loamy soil would contain from two-tenths and upwards of potash, and other things in proportion; and although the whole of this might not be available at any one time, the constant stirring of the land bringing into play the action, furnished a constant supply adequate to the wants of the plants. But although there might be no danger of exhausting the land by this system of cultivation, Mr. Way did not see what good reason there was for continuing it on the same land for more than a certain number of years—say seven or ten—and then alternating with other land which had been meanwhile under manure. In conclusion, he begged to say that, having shown as far as he was able the admissibility of the improved Tullian system on theoretical considerations, his duty was over: it was for practical men themselves to test thoroughly the merits of the plan, and to decide upon its ultimate adoption or rejection.

On the motion of Mr. Gadesden, seconded by Mr. Wolryche Whitmore, the best thanks of the Council were voted to Prof. Way, for the favour of this second lecture on a subject of so much interest and importance.

Captain Wentworth Buller, R.N., had visited the Rev. Mr. Smith's farm at Lois-Weedon; and he went to it as sceptical as a man could go. He was told that wheat had been grown for six years successively on the same land, and was informed of the application of labour to the several operations of the crop. He resolved, if possible, to pick holes in the system. He examined the thrasher and the labourers on the farm; he looked over the crops; but he was unable to detect any error in the statements made to him. Mr. Smith showed him his wheat, and the fields on which his average crops of 36 bushels an acre had been raised: his men corroborated his assertions. He ascertained the price of digging, and found that people could earn 2s. a-day. All the manure was applied to the green crops, which were as marvellous as the corn-crops. He had first a heavy crop of rye cut in April, then swedes, and afterwards trenching. There was not too much or too little moisture. The roots extended to 18 inches. The crop being never checked, the straw, as in Mr. Hewitt Davis's system, was bright, from the vegetation not being retarded. Captain Buller had procured some of Clayton's three-pronged forks, 18 inches long, for the purpose of ascertaining what could be done on this plan. They were worked by day-labourers, at the common wages of the country. They dug 6½ rods a-day of light, stony soil, thoroughly well, to the depth of 18 inches, at about 3d. a rod. He had been surprised at the amount, excellence, and economy of the work executed.——Mr. Rodwell, of Alderton Hall, had used the fork much on his own property in Suffolk. The forks were of the light spit kind, and the best were made in that county; they went to the depth of 18 inches, and turned the soil completely up. A thousand acres of land had been dug to that depth, at from 2½d. to 3d. the square rod, for the purpose of taking up the chicory crop. The expense of this forking was from 30s. to 33s. 4d. per acre; and the labourers, during the winter months—from October to April—could earn from 10s. to 12s. per week.——Mr. J. Mainwaring Paine being extensively engaged in hop cultivating, had his attention much directed to operations of the nature then referred to. He trenched at intervals, and every year dug 200 acres to a perpendicular depth of 18 inches. The cost was greater at the first digging. It cost him 24s. per acre to bring the bottom soil to the surface. It perhaps might be better to do it at two spits, in the same manner as Mr. Smith did, in which case it would cost him 30s. per acre. The labourers can earn from 2s. to 2s. 6d. a day. He had found one-horse scarifiers the

best for intervals. He had seen wheat crops on land well manured with ammoniacal salts, guano, and other substances, look poor and blighted; while those on adjoining portions of the same land—treated on Mr. Smith's plan, retaining in the soil an available stock of nutriment without being required to be manured for the current year—were looking remarkably well, and yielded 7½ quarters of wheat. By applying to the crop itself a large amount of ammoniacal matter, a great portion of it was lost for the immediate purposes of vegetation. In reply to an inquiry, he stated that he had known ashes or burnt turf applied for carrots seven years ago.—Mr. Hamond thought the nature of the soil ought to be taken into consideration. He had paid 24s. an acre for trenching at 18 in. intervals. He considered that Mr. Smith's charge of £2 a load for straw on the credit side of his account was too much.—Mr. Gadesden remarked, that he was much struck with that part of the lecture where it was stated that so small a proportion of the inorganic elements of a soil are exhausted by cropping. The question of exhaustion was one that had been often raised against Mr. Smith's system. It appeared, however, that such exhaustion would be practicably almost impossible, provided the soil was from time to time kept in a state of sufficient comminution. Professor Way had placed the subject in a new and clearer light. He had even said that it would be cheaper to supply manure than to go on growing crops without it. If, however, Mr. Smith's crops in this, their seventh year, were better than Mr. Gadesden's show-crop last year, and the profit of such system of cultivation should continue unabated, he himself could see no reason for its being abandoned; as no person would cease to cultivate profitably. The expense of cultivation, too, was rendered light by the implements which Mr. Smith employed, the principal of which was a single-horse scarifier that worked two lands at a time. Mr. Gadesden's operations being carried on in heavy land in Surrey cost him more money than Mr. Smith's at Lois-Weedon on a lighter soil. He had now 17 or 18 acres in cultivation under the new system; but the season had been particularly trying, and the autumn having been dry, the grain had lain long in the soil; he found the system a difficult one to carry out in such seasons. Mr. Smith's object, he believed, was to get the wheat to tiller before winter, not to be retarded till the spring. In wet weather the scarifier could not be worked.—Prof. Way replied, that he did not mean to say that the time would come when the system would be abandoned; but that it would be continued as long as it was found to go on profitably. He saw, however, no reason why manuring should not continue to be applied to green crops, and should only be omitted for wheat. There would be no harm in carrying on the system under the same circumstances for ten years. A time of improved mechanical appliances might supersede the use of manures; while, on the other hand, a cheaper source of ammonia might be discovered.—Capt. Buller remarked that as Mr. Smith's land was on the oolite, it might yield a larger amount of mineral matter to vegetation, while the climate was favourable, and the amount of rain small. He understood that Mr. Smith attached great importance to the effects of exposure to frost, and accordingly that he turned up his land rough for the purpose of receiving the full benefit of that influence.—Mr. Whitmore hoped that the lecture they had just heard would be published in the Society's Journal, in order that it might, on account of its importance, receive the full attention of the members.—In reply to an inquiry by Mr. Baskerville Glegg, Mr. Thomas Smith remarked that if anything ruined fox-hunting it would be the winter-beans, which, October planted in lines five feet apart, yielded 7¼ quarters to the acre.—Mr. Rowlandson thought that in addition to the fertilizing effects of the system, a great deal depended on the time of sowing. It had just been said that wheat ought to tiller in winter. In eastern countries, when wheat tillered before Christmas, the hogs were turned into it. He considered that early sowing would be productive of great results: winter-sown oats in Surrey would return double. While acknowledging the full merits of Mr. Smith's operations, he was still of opinion that time of sowing was as important a point as the preparation of the land. Mr. Rowlandson regarded agriculture as the fasciculus of all the sciences, none of which can be neglected without in a certain degree injuriously affecting its operations; and however correct any science might be in itself, its application would lead to many errors, unless all the circumstances and bearings of each particular case were duly taken into consideration.—Mr. Paine had just seen a crop, sown on the 9th of November, looking at that time as well as could be desired.—Mr. Rodwell thought that no stated rule could be laid down for the time of sowing, either in reference to the soils or climate of different parts of the kingdom. He knew soils in the same county and parish on which it would be unwise to sow in every case either uniformly early or late. He had gained the experience of a great many years on that point, but found that it was difficult to lay down any fixed rule on the subject. He might, however, venture to say that good lands were better adapted for being sown in October and sandy soils in December.—Mr. Gadesden observed that Mr. Smith had sown wheat on the 11th of September, that he was obliged the month after to plough up, in consequence of the grain having matted on the soil.—Mr. Rodwell referred to the gradual modification of his practice of manure by the experience of successive years. When he first sowed corn, he applied to his land 20 loads, or 15 tons, of farm-yard manure to the acre, agreeably with the practice also followed at that time in the adjoining county of Norfolk. He then gradually reduced his manuring to one-half that amount; afterwards to 20 loads in four years, applying it twice during that period at 10 loads per acre. He believed that if he could put on each year only five loads per acre, or still smaller quantities at shorter intervals, he should derive greater advantages than from a greater quantity applied at once.—Mr. Thomas Smith remarked that he believed it was the opinion of his brother that it would be best to go on at Lois-Weedon for a year or two longer on the present plan, and then to introduce root crops into the system.

The Council then referred these lectures of Prof. Way, and interesting results connected with Tullian cultivation, kindly communicated to the Society by Mr. Hay, of Dunse Castle, to the Journal Committee. Communications from Mr. Spencer Stanhope on a tria of manures, and from Mr. Peter Love on facts connected with the deposition of siliceous matter on the wheat-stalk, illustrating points discussed in a former lecture by Prof. Way, was also referred to that Committee.

Deputation on Guano.—The following Members of Council and Governors of the Society met by appointment in the Council Room at the House of the Society at half-past two o'clock, previously to assembling at four o'clock at the official residence of the Prime Minister, in Downing-street, as part of the Deputation which the Earl of Derby—on the representation of the Earl of Ducie, as the President of the Society—had expressed the pleasure it would give his Lordship to receive: namely, the Duke of Richmond, Lord Berners, Hon. R. H. Clive, M.P., Baron Goldsmid, Sir John Villiers Shelley, Bart., Sir Charles Lemon, Bart., M.P., Mr. Alcock, M.P., Mr. Raymond Barker, Captain Went-

worth Buller, R. N., Captain Stanley Carr, Rev. Thomas Cator, Colonel Challoner, Mr. Fisher Hobbs, Mr. Hudson, of Castleacre, Mr. Thompson, Prof. Way, and Jonas Webb.

The Duke of Richmond having taken the Chair it was arranged that the Deputation should, in its interview with the Prime Minister, confine itself to the object for which it had been specially appointed by the Council—namely, "to represent to his Lordship the importance of taking every possible means to effect a reduction in the price of Guano." At the request of the Meeting, Captain Buller and Mr. Hudson, of Castleacre, consented to address the Earl of Derby on the part of the Deputation.

Captain Stanley Carr presented to the Society an interesting Spanish work on Guano, published last year at Lima, and entitled, "Estudios sobre el Huano, ó Historia de las Contratas celebradas, por el Gobierno para su expendio exterior; precedida de Reflexiones Generales sobre sistemas de cultivo y abonos: por L.G.S"—for which attention the Meeting expressed to him their best thanks.

The Members who attended that Meeting having adjourned, at 4 o'clock, to Downing-street, were joined by the following additional Members of the Society, with whom, accompanied by Mr. Hudson, their Secretary, they formed the Society's Deputation to the Earl of Derby—namely, the Duke of Buccleuch, Hon. Colonel Douglas Pennant, M.P., Hon. Edward Lloyd Mostyn, M.P., Right Hon. Sir James R. G. Graham, Bart., M.P., Sir Robert Price, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Mr. Bramston, M.P., Mr. Ivat Briscoe, Mr. Darby, Mr. Fellowes, M.P., Mr. Floyer, M.P., Mr. Freeland, Mr. Fuller, M.P., Mr. Langston, M.P., Mr. Walter Long, M.P., Mr. Marshall, M.P., Mr. Nesbit, Mr. Odams, Mr. Wilson Patten, M.P., Mr. Robartes, M.P., Mr. Rowlandson, Prof. Sewell, M.P., Mr. Slaney, M.P., Mr. Crompton Stansfield, M.P., and Mr. Wreford.

In the absence of the Earl of Ducie, the President of the Society, who was confined at that time to his bed by severe illness, the Deputation was headed by the Duke of Richmond, and introduced by his Grace to the Prime Minister. Captain Buller and Mr. Hudson, of Castleacre, then addressed the Earl of Derby on the part of the Deputation; and his Lordship, in the course of his reply, promised to aid the object of the Society by every means that then were or might afterwards be placed within his power. The Deputation then expressed their acknowledgements of his Lordship's courtesy in admitting them to an interview, and retired.

A Weekly Council was held on Wednesday, the 16th of June—present, the Duke of Richmond, Trustee, in the Chair; Lord Bridport, Hon. R. H. Clive, M.P., Sir John Villiers Shelley, Bart., Sir John V. B. Johnstone, Bart., M.P., Mr. Arkwright (Hampton Court), Mr. Raymond Barker (Hambledon), Mr. H. Raymond Barker, Mr. Briscoe, Mr. Browne, Mr. Buller (Dilhorne), Mr. E. Bullen, Dr. Calvert, Rev. T. Cator, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Baskerville Glegg, Mr. Grantham, Mr. Fisher Hobbs, Mr. Law Hodges, M.P., Mr. Horatio Kemble, Mr. Lennox Naper, Mr. Townley Milford, Mr. C. E. Overman, M. Malvicieux (Paris), Mr. Parkins, Mr. Rowlandson, Prof. Sewell, Prof. Simonds, Mr. Simpson, Mr. Reynolds Solly, and Mr. R. Trench.

Substitute for Guano.—Mr. Fisher Hobbs gave notice that he should move the following resolution at the ensuing Monthly Council on the 7th of July; namely—"That a prize of £1,000 and the Gold Medal of the Society be offered for the discovery of a Manure, equal in fertilizing properties to the Peruvian Guano, and of which an unlimited supply can be furnished to the English farmer, at a rate not exceeding £5 per ton."

Points of Cattle.—Mr. Overman called the attention of the Council to the established success, as he understood, of that system of ascertaining the milking qualities of dairy from external relations and configuration, which M. Guénon had submitted to the consideration of Members of the Society, at the Northampton Meeting, in the year 1847; and at the same time brought under the notice of the public, by re-publishing in that year (through Messrs. Longman and Co.) the English translation, which had been already printed in France, of the work containing the details and illustrations of his system. Experience had since that date been gained in these discriminations, and their correctness confirmed or modified by practical reference to animals of well-known qualities in various parts of the Continent as well as in this country, especially in Ireland, where a translation of M. Guénon's work had been published in successive numbers of the *Farmers' Gazette*, and subsequently in a collected form by Messrs. Orr and Co., of Paternoster-row, in London.—Mr. Fisher Hobbs could bear testimony to the value of these criteria; for having on one occasion met M. Guénon at Castleacre, he was surprised to find that M. Guénon selected from among the Devon cattle on that farm, by means of external formation and peculiar developments, exactly those animals which Mr. Hudson knew from actual experience to be the best dairy cows of his herd—The Duke of Richmond thought that this was a subject of great interest and importance, and one that well deserved to be referred to a committee of practical farmers. He would not, however, confine these points to Dairy Cattle generally, any more than to the Channel Islands' Cattle in particular. He had been favoured by Colonel Le Couteur with scales of points for Short-horns and other breeds, drawn up in a similar manner to those of the Jersey Cattle, which were last year placed in the hands of the judges in that class at Windsor, when their awards gave so much satisfaction to all parties. His Grace was in communication with Colonel Le Couteur on this subject, and he would take an opportunity of laying these scales of points before the Council. He would repeat, however, that it would be desirable to have the whole question submitted to the consideration and actual test of a committee of practical farmers, with a request that they would report their recommendations to the Council.—Dr. Calvert had not yet been able to understand the origin of the difference in the quality of milk given by the same cows on different farms. He was aware that difference in the amount and quality of the herbage would often account for difference in the amount and quality of the milk; but he had met with many cases in which this circumstance was not sufficient to furnish a satisfactory explanation; and he thought these various external conditions of pasture and management of the cows themselves were important ones to be considered.

Miscellaneous Communications. — Sir John Conroy, Bart., transmitted to the Council a sample of wheat grown at Arborfield Hall in 1851, and sold in Reading market, on the 5th of June, 1852, at 52s. a quarter: it was seeded under three pecks to the acre, and drilled in at 13 inches apart; it yielded five quarters to the acre, and weighed 65lbs. to the bushel.—Mr. Scratton, of The Priory, near Prittlewell, Essex, communicated the particulars connected with the blight that had appeared extensively among his own winter beans and those of his neighbours.—Mr. Farmer, of Fazeley, suggested an inquiry on the subject of the chicory crop: "What were its properties, and whether it could not be

grown for other purposes than as a substitute for coffee; such, for instance, as brewing beer, wholly or in part as a substitute for malt, or for feeding purposes in the cases of horses and pigs."—Mr. Hill Dickson, of 26, Gresham-street, informed the Council of the near completion of his Portable Flax-Breaking, Scutching, and Heckling Mills for farmers, and invited a personal inspection.—Mr. Croll, of Bow Common Lane, called the attention of the Council to a simple test of the purity of sulphate of ammonia, founded on its being volatilisable at a red-heat, while the earthy impurities would remain behind on the shovel or other plate of iron used for the purpose.—Mr. Freeman Roe, of 70, Strand, presented a Camoys block-tin Dairy Siphon, with piston and wooden stand complete, which he would manufacture for the agricultural community at one-half the lowest price yet charged for them—namely, at 1s. 6d.—The Council ordered their usual acknowledgments for the favour of these communications.

A Weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 23rd of June: present, the Earl of Ducie, President, in the Chair; Lord Berners, Sir John Villiers Shelley, Bart., Sir Robert Price, Bart., M.P., Sir Henry Shiffner, Bart., Sir John V. B. Johnstone, Bart., M.P., Col. Austen, Mr. Raymond Barker, Mr. Browne, Capt. Wentworth Buller, R.N., Dr. Calvert, Mr. W. G. Cavendish, M.P., Mr. George Dyer, Mr. C. Eyre, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Glegg, Mr. Fisher Hobbs, Mr. H. Kemble, Mr. Rowlandson, Prof. Sewell, Mr. Simpson, Mr. Robert Smith, Mr. Solly, Mr. Spencer Stanhope, Mr. Trench, and Prof. Way.

Mr. Scratton made further communications to the Council on the progress of the blight in winter beans.—Mr. Gadesden stated that his own crop had been attacked, and he understood that in Northamptonshire and Somersetshire similar crops, in one instance to the extent of forty acres, were mowed down and carried to the manure-yard in large quantities.—Mr. Fuller, M.P., reported the attack of his cabbages, in Sussex, by a small white maggot eating into the stems and roots.—The Earl of Tyrconnel transmitted communications from Sir Gardner Wilkinson and Mr. Grimstone, on the subject of Egyptian wheat and peas, of which his Lordship favoured the Council with specimens.—Messrs. Swinburne reported their manufacture of cheap glass utensils for dairy purposes.—The Council ordered their usual acknowledgments for the favour of these communications.

A Special Council, for deciding on the Judges to be selected for the Lewes Meeting, was held on Wednesday, the 23rd of June: present, the Earl of Ducie, President, in the chair; Mr. Raymond Barker; Mr. W. G. Cavendish, M.P.; Mr. Brandreth Gibbs; Mr. Fisher Hobbs; Mr. William Simpson; and Mr. Robert Smith. The Council took into consideration the special object of their meeting, and decided on the Judges to be appointed in the various departments of the Exhibition at the Lewes Meeting.

A Monthly Council was held at the Society's House in Hanover-square, on Wednesday, the 7th of July. The following Members of Council and Governors of the Society were present: The Earl of Ducie, President, in the chair; Lord Southampton; Mr. Raymond Barker; Mr. Barnett; Mr. Brandreth; Mr. W. G. Cavendish; Colonel Challoner; Mr. Druce; Mr. Gadesden; Mr. Hamond; Mr. Fisher Hobbs; Mr. Hornsby; Mr. Kinder; Mr. Milward; Mr. Mainwaring Paine; Mr. Shaw; Prof. Simonds; Mr. Simpson; and Prof. Way.

The following new members were elected:

Phillips, G. L., Ashdale, Haverfordwest, Pembr.
Pym, Francis Leslie, Radwell House, Baldock, Herts.
Howe, Edward, Morningthorpe, Long-Stratton, Norf.
Court, P. S., Saltwood, Hythe, Kent
Brown, George, Avebury, Marlborough, Wilts.
Phillips, James B. L., Malws, Aberystwith, Card.
Underhill, Henry, Wolverhampton, Staffs.
Asplin, Charles, East Tilbury Place, Romford, Essex
Chatfield, Robert, Greatham House, Petworth, Sussex
Squier, Samuel W., Langdon Hills, Romford, Essex
Abbott, William, Woodhouse Carr, Leeds, Yorks.
Skinner, James, Sherrington House, Selmeston, Lewes
Bennett, Luke, Dimsdale Hall, Newcastle, Staffs.
Cane, Edward, Berwick, Lewes, Sussex
Baker, William, West Johnson, Bps. Nympton, Devon
Dixon, Henry, Frankham, Wadhurst, Sussex
Fulton, Hamilton Henry, C.E., Great Queen-street, Westminster
Greaves, Edward, Barford, Warwick
Murray, Robert, Keston, Bromley, Kent
Bullen, Edward (Barrister-at-Law), Upper Sackville-street, Dublin
Pain, Thomas, Salisbury, Wilts
Graburn, William John, Melton-Ross, Lincolnshire
Holroyd, Frederick, New North-road, Huddersfield, Yorks
Rolt, John, Ozleworth Park, Gloucester
Milles, John, The Forest, Tunbridge, Kent.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, presented to the Council the monthly report on the accounts of the Society, from which it appeared the current cash balance in the hands of the bankers was £2,823. This report was received and adopted.

Reports were read and confirmed from the Chemical Committee, on the favourable prosecution of Prof. Way's researches; from the General Lewes Committee, on the completion of the arrangements for the ensuing country meeting; and from the Veterinary Grant Committee, requesting a postponement of their recommendations to the monthly meeting in November.

Substitute for Guano.—On the motion of Mr. Fisher Hobbs, seconded by Colonel Challoner, the following motion, of which Mr. Fisher Hobbs had given notice at a former meeting, was carried unanimously—namely, "That a prize of £1,000, and the gold medal of the Society, be offered for the discovery of a manure equal in fertilizing properties to the Peruvian Guano, and of which an unlimited supply can be furnished to the English farmer at a rate not exceeding £5 per ton." The Council appointed the following Committee to take into consideration the conditions under which the competition for this prize should take place, and to report to the Council their recommendations on the subject—namely, The Earl of Ducie, Chairman; Sir John Villiers Shelley, Bart.; Mr. Raymond Barker; Captain Wentworth Buller, R.N.; Colonel Challoner; Mr. Fisher Hobbs; Mr. Hamond; Mr. Hudson, of Castleacre; Mr. Shaw; and Mr. Thompson.

Fat Cattle.—On the motion of Mr. Simpson, it was resolved unanimously, "That, at the proper time, the Council take into their deliberate consideration the special instructions to be given to the Society's Judges of Live Stock at its future Country Meetings, respecting animals that may be exhibited on those occasions in an overfed condition inconsistent with their character and value as breeding stock.—The President then gave notice that, at the first Council he should be able to attend after the expiration of his year of office, he would be prepared to bring forward this important question for their consideration, and at the same time to offer a suggestion whether it might not be advisable at future Country Meetings to have both a fat stock and a store stock division, in different departments of the Show.

The Annual Country Meeting of the Society, comprising an exhibition of live stock (including poultry), an exhibition and trial of agricultural implements and machinery, and a Pavilion Dinner, took place at Lewes, in Sussex, in the week commencing Monday, the 12th of July. We have already given ample details of the whole of these objects, with the exception of the General Meeting of the Members, held at the County Hall on Friday, the 16th of that month, Mr. Raymond Barker, Vice-President, in the chair. The following resolutions were passed unanimously:

1. On the motion of Lord Berners, seconded by Mr. Shaw: "That the best thanks of the Society be conveyed to the Chief Officers of the Borough of Lewes, for their cordial co-operation in promoting the arrangements for the Lewes Meeting."

2. On the motion of Mr. Wilson, seconded by Mr. Milward: "That the best thanks of the Society be given to the Local Committee, and Mr. H. Davey, their Secretary, for the kind and zealous attention they had shown to the wishes of the Society in carrying out the details connected with the arrangements for the Meeting."

3. On the motion of Mr. Fisher Hobbs, seconded by Mr. Barnett: "That the best thanks of the Society be expressed to those owners and occupiers who had placed their land at the disposal of the Society for the trial of implements, and as sites for the Show-yards and Pavilion."

4. On the motion of Mr. Grantham, seconded by Mr. H. Bannerman: "That the best thanks of the Society be signified to Professor Simonds for the important lecture he had delivered before the members at the Lewes meeting, and for the interesting series of original drawings, illustrating on a magnified scale the result of his microscopical investigations on the subject, he had prepared for the purpose of that lecture."

5. On the motion of Mr. Fisher Hobbs, seconded by Lord Berners: "That the best thanks of the Society be expressed to the various railway companies throughout the kingdom for their liberal co-operation in promoting the objects of its country meetings, and for the extraordinary assistance rendered to the exhibitors by the officers of those lines that were more especially and locally connected with the Lewes Meeting."

6. On the motion of Lord Berners, seconded by Mr. Grantham, and Mr. Shaw: "That an expression of the best thanks and respect of the Society be conveyed to the Earl of Ducie, for the devoted and conscientious discharge of the high duties of his office during the year of his Lordship's presidency, which terminated at the Lewes meeting."

7. On the motion of Lord Berners, seconded by Mr. Milward: "That the cordial thanks of the General Meeting of that day be given to the Chairman, Mr. Raymond Barker, for his kindness in presiding on that occasion, and for the services he had so willingly rendered at all times to the Society."

Mr. Barker acknowledged the kind compliment then paid him. It was gratifying for him to receive so pleasing a mark of their approval. He was sincerely attached to the Society, and ready under every circumstance to lend his co-operation for the advancement of its truly national objects.

Mr. Wilson, of Stowlangtoft, remarked that he could not allow the meeting to separate without informing the Members of the unanimous satisfaction of the implement-makers with every arrangement connected with the exhibition and trial of their implements and machines, and with the adjudication of the prizes.

A Special Council was held in the County Hall, on the same day, for the purpose of giving any local orders that might be required at the close of the Country Meeting; present, Mr. Raymond Barker, V. P., in the Chair, Mr. Barnett, Mr. Milward, Mr. Shaw, and Mr. Wilson.

A Weekly Council was held at the Society's House in Hanover-square, on Wednesday, the 28th of July; present, Colonel Challoner, Trustee, in the Chair, Sir Robert Price, Bart., M.P., Mr. Raymond Barker, M. de Chroustchoff (Chamberlain to the Grand Duchess Catherine of Russia), Mr. H. P. Jones, Mr. Rowlandson, Prof. Sewell, Mr. H. A. Smith, and Prof. Way.

Inoculation for Pleuro-Pneumonia. — His Royal Highness Prince Albert transmitted to the Council, through Colonel The Honourable Charles Grey, a communication addressed to His Royal Highness by Dr. de Saiville, of Brussels, on the result of his investigations during twenty-five years, on the "Pneumonie Exsudative épizootique des bêtes bovines," and his desire to test the value of his curative system by inoculation on animals in this country. The Council ordered their best thanks to be conveyed to His Royal Highness Prince Albert for this kind attention on His Royal Highness's part to the national objects of the Society; and at their request Professor Sewell, of the Royal Veterinary College, undertook to consult with Prof. Simonds on the communication and proposal in question, and to make a joint report on the subject at the next meeting of the Council.

Production of Heat and Light.—Mr. Warriner, of 16, Panton-square, transmitted to the Council the following communication, dated the 28th of July:—

"I take the liberty of submitting a short statement of an invention which, after a long series of trials and difficulties, has latterly come into use in France, and which I think is likely to prove useful in agriculture, and to be at the same time a great boon to the horticulturist. It is the production of pure hydrogen gas from water, for the purpose of heating, lighting, drying, and malting. The production is exceedingly simple. In any place already furnished with a steam boiler, the addition of three retorts, of the size of three feet long by fourteen inches diameter, will give 2,000 cubic feet of gas per hour. The cost of such gas is small, as, in its purification, which is made over the carbonate of soda, the bi-carbonate is produced, which repays the cost of fuel and wear and tear of production. The mode by which it is produced is as follows. The fires being lighted under the boilers and retorts, the last become white hot by the time the steam is produced from the boiler. When heated, the mouth of the retort is opened, and a layer of about two inches thick of small charcoal or braize is thrown in, the lid is then replaced, and in about three minutes the steam is turned on into the pipes, which are inside of the retorts. These pipes are perforated with small holes, having capsules on them, by which the steam is distributed over the charcoal, and thus becomes decomposed, and forms gas; the gas then passes up the pipe into the hydraulic main, where any steam that may escape decomposition is condensed. The gas then passes into the purifiers, the plates of which are covered with carbonate of soda, and, as the gas consists of two parts carbonic acid and one part pure hydrogen, the soda absorbs the carbonic acid, and the pure hydrogen passes into the gasometer, for the supply of any place were required. The flame of this gas being blue, the light is obtained from allowing the flame to play upon a net-work of platinum wire, which becomes white hot, and gives a brilliant steady light, without smoke or flame. In the public lights now at Passy, near Paris, a distance of 150 metres exists between each, whereas in the common gas 50 metres only are allowed. The advantage which this gas possesses over the common coal gas is the facility of manufacture, no unpleasant residuum, and its cheapness, which will cause it to be introduced into all large establishments at any distance from a town. For the purpose of warming conservatories, it is invaluable. The cost of the apparatus for 50 lights is about £50, 100 lights £100, and so in proportion."

Mr. Rowlandson thought the proposed plan would be useful if there were a great demand for the Bi-carbonate of Soda produced; this demand, however, on which the economy of the process appeared to depend, was not likely, he thought, to arise; and he had known an instance a few years ago of this salt being produced in a chemical manufactory more largely than it could be sold off. Colonel Challoner thought it was advisable in all cases of proposed new applications to bring their practicability to the test of actual experience. The Council ordered their usual acknowledgments to Mr. Warriner for his attention in submitting this communication to their notice.

Destruction of Deep-rooted Weeds. — The Council had their attention called to a mode, proposed in Belgium, for destroying docks, thistles, and other deep-

seated weeds, by the insertion of a drop of oil of vitriol into the upper part of their root; which, it was stated, at once acted corrosively on its substance and destroyed the vitality of the plant.

Mr. Rowlandson favoured the Council with an interesting account of the progress of the Earl of Essex's operations at Castiobury, in tilling at intervals on the London clay; which, although similar to the red flinty clay, and consequently stiff and impervious, had become under his Lordship's system of management, by digging and ploughing, as friable as the most friable loams. Mr. Rowlandson had been much struck with the extraordinary results he had witnessed.

A Monthly Council was held at the Society's House, in Hanover-square, on Wednesday, the 4th of August. The following Members of Council and Governors of the Society were present:—Mr. Raymond Barker, Vice-President, in the Chair; Lord Bridport, Colonel Austen, Mr. Blanchard, Mr. Bramston, M.P., Colonel Challoner, Mr. Freeland, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Milward, Prof. Sewell, Mr. Shaw, Prof. Simonds, Mr. Simpson, Mr. Wilson, of Stowlangtoft, and Prof. Way.

The following new Members were elected:—

Wilson, John, Seacroft Hall, Leeds, Yorkshire
Saurans, Thomas, Watercombe, Wareham, Dorset
Churchill, William, King's Head, Gloucester
St. Albans, Duke of, Radbourne Hall, Brigg, Lincolnshire
Errington, Rowland, Saudoe, Hexham, Northumberland
Gatty, George, Crowhurst Place, Battle, Sussex
Grattan, Right Hon. James, Tennikenill, Enniskerry, Ireland
Churchill, T. B., The Plough Hotel, Cheltenham
Noel, Charles, Bell Hall, Stourbridge, Worcestershire
Gurney, Russell, Q.C., 37, Russell Square, London
Clay, Nicholas, Enfield, Chipping-Ongar, Essex
How, William, Bideford, Devonshire
Harcourt, Rev. L. Vernon, Westdean House, Chichester
Thompson, John, Badminton, Chippenham, Wilts.
Walter, John, Gosport Oak, Tipton, Staffordshire
Halkett, Rev. Dunbar, Rector of Little Bookham, Surrey
Carr, Major, Lancing, Shoreham, Sussex
Lakeman, John, Costislost, Bodmin, Cornwall
Sperling, Henry Grace Wilson, 10, Hyde Park Terrace, London.

Finances.—Mr. Raymond Barker, as Chairman of the Finance Committee, laid before the Council the Monthly Report on the accounts of the Society; from which it appeared that the current cash-balance in the hands of the bankers was £2,650. The quarterly statements of income and expenditure, invested capital and liabilities, were laid on the table for the information of the Members. The Council confirmed the recommendation of the Committee that the claims against the Society on account of the Lewes Meeting should at once be ascertained and discharged.

Fines.—The Council ordered a letter to be addressed to each person who had become liable to the fine for non-exhibition of implements or stock entered for the Lewes Meeting, requesting the payment of the same agreeably with rules of the Society.

Implements.—Colonel Challoner, Chairman of the Implement Committee, having presented the report of that Committee, the Council made the following decisions:—

I. That £10 and a Silver Medal be awarded to Messrs. Clayton, Shuttleworth, and Co., for their having exhibited at the Lewes Meeting a Fixed Thrashing Machine, with *finishing* dressing apparatus, which performed, in the opinion of the Judges, and to their entire satisfaction, every operation of thrashing, shaking the straw, dressing the corn in the most perfect manner, and weighing it into sacks.

II. That the Prize of £10, offered for the best Light Waggon for general purposes, should be divided between Mr. Crosskill and Mr. W. Ball, the Judges, in accordance with their 3rd Instruction, having specially reported to the Council their opinion, that in the competition for that prize the respective waggons of those exhibitors were the two best in that department, and possessed equal merit.

The Council then proceeded to the consideration of the Prizes to be offered for Implements and Machinery at the Gloucester Meeting next year, and agreed to the following schedule, deferring their decision on the conditions of competition and the regulations of the Prize-sheet till their Monthly Meeting in November:—

Plough best adapted for general purposes	£7
Plough best adapted for Deep Ploughing	7
One-way or Turn-wrest Plough	7
Paring Plough	5
Dynamometer for traction of ploughs	5
Subsoil Pulverizer	5
Draining Tile or Pipe Machine	10
Instruments for Hand-use in Drainage	3
Heavy Harrow	5
Light Harrow	5
Cultivator, Grubber, and Scarifier	10
Pair-Horse Scarifier	5
Drill for general purposes	10
Steerage Corn and Turnip Drill	10
Drill for small occupations	5
Small-occupation Seed and Manure Drill	5
Turnip Drill on the flat	10
Turnip Drill on the ridge	10
Dropping Machine, for seed and manure	10
Manure Distributor	10
Horse Hoe on the flat	5
Horse Hoe on the ridge	5
Agricultural Tools for hand-labour	5
Reaping Machine	20
Mowing Machine for grasses	10
One-Horse Cart for general purposes	5
Light Waggon for general purposes	10
Portable Steam-Engine, not exceeding 6-horse power	20
For the second-best ditto, ditto	10
Fixed Steam-Engine, not exceeding 8-horse power	20
For the second best ditto, ditto	10
Portable Thrashing Machine, not exceeding 2-horse	10
Portable Thrashing machine, not exceeding 6-horse power	15
Port. Thrash. Machine, not exc. 6-horse power (finishing)	20
Fixed Thrash. Machine, not exc. 6-horse (market)	20
Corn-dressing Machine	5
Ditto, ditto, for small occupations	5
Grinding-Mill for meal	10
Linseed and Corn Crusher	5
Chaff-Cutter, by horse or steam power	10
Chaff-Cutter, by hand-power	5
Turnip-Cutter	5
Oilcake-Breaker for every variety of cake	5
Ditto, for thin cake	3
Steaming Apparatus for general purposes	5
Flax-straw Machine, by manual or other labour	10
Churn	3
Misc. Awards and Essential Improvements	21
New Implement, such sum as the Council may decide	—

General Gloucester Committee.—The Council then agreed to the appointment of the following General Gloucester Committee, namely: The Earl of Ducie (Chairman), Duke of Richmond, Earl of Chichester, Lord Portman, Hon. R. H. Clive, M.P., Sir John Villiers Shelley, Bart., M.P., Sir Matthew White Ridley, Bart., Sir John V. B. Johnstone, Bart., M.P., Col. Austen, Mr. Raymond Barker, Mr. Barnett, Mr. Brandreth, Col. Challoner, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Jonas, Mr. Wiliam Jones, Mr. Charles Lawrence, Mr. Milward, Mr. Pusey, Mr. Shaw, Mr. Simpson.

Inoculation for Pleuro-Pneumonia.—Professor Sewell and Professor Simonds reported their opinion on the question of introducing the inoculation system for cattle into this country; and although they were adverse

to such introduction in the present stage of the inquiry, they thought it desirable that the Society should have full knowledge of the facts connected with this subject, which occupied so large a share of attention in Belgium, Holland, France, and Prussia, at the present moment. They hoped during the ensuing recess of the Council to gain such an estimation of the exact nature of the new curative system as would enable them to report more circumstantially to the Council at their November Meeting.

Potato Disease.—Mr. Dawson transmitted to the Council a synopsis of the several communications on the cause and cure of the Potato Rot, received by the Executive of Massachusetts, in consequence of a prize of 10,000 dollars offered to any person within that commonwealth who should satisfy the Governor and Council that by the test of at least five successive years, he had discovered a sure and practical remedy for that malady. This document, prepared and just published under the authority of the legislature of Massachusetts, by Mr. Amasa Walker, secretary to that commonwealth, contains the following summary of these communications:—

Although these communications may not furnish any perfect cure or preventive of the potato disease, yet they agree in so many important points, and offer so many valuable hints, relating to the nature, cultivation, preservation, and improvement of the potato, that they cannot fail to be of great public utility. The similarity of views expressed by the most intelligent and experienced writers, relating to the nature, cultivation, disease, and cure of the potato, is truly remarkable, and we think auspicious. Among the principal points, relating to which there is a general concurrence, are the following:—

Soundness and Vitality of the Seed.—Renewing the seed from the ball of healthy vigorous plants every few years, even resorting to the native place in South America, and taking the seed from the wild potato, is considered important. When potatoes are to be raised from the tuber, sound, healthy, whole potatoes are recommended for planting. Cutting potatoes is decidedly condemned. Anything which impairs the vitality of the seed increases the liability to disease.

Quality or kind of Soil.—A dry, light, loose, warm soil, is considered necessary to the soundness and health of the vegetable, as well as to its richness and flavour, the latter depending quite as much on the quality of soil as on the variety of seed. A wet, heavy, compact soil, directly promotes the disorder. Far up on the side of a mountain or hill is a favourable location for the growth of the potato; and new land contains more of the qualities requisite for its nourishment and health, than old or worn out soils.

Influence of Atmosphere.—Potatoes should be as little exposed to the air as conveniently may be. Their natural place is under ground. By too much exposure they become poisoned, and turn green. Some recommend depositing them for the winter in holes under ground in a dry soil; or if kept in a cellar, to preserve them dry, in small quantities, in sand; and to keep them cool. Keeping large quantities in a body in the cellar is by some supposed to promote heat and putrefaction. Planting in the fall is recommended by some, as potatoes left in the field, over winter, are observed to come forward earlier in the spring, to grow more vigorously, to get ripe earlier and before the blighting rains in August, and to be more sound, fair, and healthy.

Manures.—All antiputrescents, such as lime, wood-ashes, pulverised charcoal, plaster, salt, nitrogen, &c., are believed to contribute directly to the health of the potato, as well as to add to its richness and flavour; and, of course, to prevent putrefaction and disease. Of other manures, well-rotted compost is preferred. Stable-manure is too strong and heating, and produces ill-flavoured, unhealthy potatoes, and is decidedly condemned.

Disease, Contagion, Old Age, and Death.—These are common to vegetables as well as to animals. All are liable to disease, some more, some less, according to circumstances, predisposing causes, and preventive means. Some vegetable diseases are believed to be contagious. The present disease is thought by many to be of that class. One field of potatoes is liable to take the disorder from another field. Potatoes are predisposed to disease, by bad cultivation, old age, bad soil bad manures, sudden changes of weather, warm rains, &c.

Ravages of Insects, Fungi, &c.—The best writers consider the ravages of insects as at most but a predisposing cause, rendering the potato more liable to disease by enfeebling the plant. By many writers insects are considered as remotely affecting the potato; by others, as having no effect at all. The fungus on potatoes is not the cause of the rot. It finds the potato, previously diseased, a fit subject for its operation.

The general conclusions to which the facts presented in these various communications seem to lead us, are—

I. That the disease bears a striking resemblance to the cholera, and probably exists in the atmosphere.

II. That it is doubtful whether any specific cure has been, or ever will be discovered; but

III. As in cholera, certain preventives are well ascertained, by the application of which, the liabilities to disease may be greatly lessened.

IV. That by obtaining the soundest seed, by planting in the most favourable soils, and by using the most suitable manures, we may have a good degree of confidence in the successful cultivation of this useful vegetable.

V. That we may expect, that like the cholera, the potato rot will become less and less formidable from year to year, and eventually subside into a mild and manageable epidemic, if that term may be used in such a connexion.

The Council ordered their best acknowldgements to be conveyed to Mr. Dawson, for his attention in favouring the Society with this communication.

Mr. B. Sanderson, of Woodford Wells, in Essex, addressed a letter to the Council, conveying his experience of four years in the trial of potato cultivation in poor land without manure, during which period no taint of disease had made its appearance, although the original stock of tubers had been diseased while grown with manure.—The Council ordered their best acknowledgments also for the favour of this communication.

Miscellaneous Communications. — M. Henri Marés, of Montpellier, Perpetual Secretary to the Agricultural Society of the Département de l'Hérault, transmitted to the Council the transactions of that Society for the last five years, with a letter expressive of the desire he felt to mark his sense of the gratification he derived last year in witnessing the results of English farming, by this offering of the record of their own cultivation of the art of agriculture in the south of France under circumstances of climate so different, and in an agricultural sense so much more trying than those of this country.—Mr. Johnson, Secretary of the New York State Agricultural Society, transmitted a copy of the details of experiments in Draining, for which prizes had been awarded to Mr. John Johnson and the Hon. T. G. Yeomans.—Mr. W. C. Fowler, of Amherst, Mass., presented a copy of the Report of Commissioners concerning the establishment of an Agricultural School, and other subjects relative to the advancement of the interests of agriculture in the Commonwealth of Massachusetts.—Mr. Klingemann, Secretary to the Hanoverian Legation, has informed the Society, that the Anniversary Meeting of the German Agriculturists will be held at Hanover from the 5th to the 11th of September next, and in the hope that Members of the Royal Agricultural Society of England would favour them with their attendance, he has transmitted to the Society a copy of the circular Invitation and the Programme for the occasion.—Mr. Parrington, Secretary of the Cleveland Agricultural Society, conveyed to the Council the thanks of that body for the steps they had taken in reference to effecting a reduction in the price of Guano.—Capt. Wentworth Buller, R.N., presented a copy of his pamphlet, entitled: "Remarks on the Monopoly of Guano."—Mr. Rowlandson addressed to the Council such suggestions, derived from his own experience, as had reference to the conditions of the Society's prize for

a Substitute for Guano.—Mr. Chaplin, M.P., Chairman of the London and South-Western Railway Company, expressed his willingness to receive from the Members of the Society, to which he also belonged, any suggestions that in their opinion would tend to promote the agricultural interest by means of railway arrangements. —Mr. Ormsby Gore, M.P., presented a sample of his flax dressed, after the removal of the seed, at a cost of 5d. per lb.—Lord Berners transmitted from Keythorpe Hall, in Leicestershire, Specimens of Turnip plants in different stages of their growth, raised in a rich loamy soil from seed transmitted to the Society by the Russian Government.—Mr. Strafford presented a copy of the tenth volume of his illustrated edition of Coates's Herd-Book of improved Short-Horned Cattle.—Mr. Bailward, of Horsington, suggested a prize for an Essay on Orchards and their management, the choice of fruit, and whether the colour of the apple can be adopted as a guide to the choice for cider-making; the best management of apples previously to grinding, and then whether any interval should elapse before pressing; after that, how cider may be best made, managed, and kept.—Dr. Coley, of Brussels, addressed a letter to the Council on the collection of seeds and grain, the free transmission of agricultural packets between England and Belgium, and the system of inoculation for Pleuro-Pneumonia.— Mr. Carr, of Belper, one of the mechanical judges at the Country Meetings of the Society, presented to each Member of the Council a pair of his machine-made horse-shoes, for which he claimed the advantages of a better bite, increased durability, more exact fitting, freedom from concussion, equal protection to the foot, less weight wear and tear, smaller nails and fewer in number, exemption from burning the foot, freedom from uneven tread, and less price, four middle-sized shoes being produced at a profit by this mode of manufacture at the small charge of one shilling for such set.—Mr. C. H. Webber, of Buckland, addressed a letter to the Council on an adaptation he had found advantageous for shaking straw.—Lieut. Browne communicated the result of his endeavours to improve the Agricultural Fumigator he had exhibited to the Council on a former occasion, by the application of a strap or wheel to turn the fan as the machine is moved along, in order that it may be adapted to the fumigation of large buildings and also of hops.—Captain Stanley Carr laid before the Council a tabular statement of the rate of charge for very economical seamless canvas hose imported by Mr. Peterson, of Water Lane, from the establishment of Burbach and Co.—Prof. Donaldson addressed a letter to the Council on his views respecting the heating power of lime in soils.—Mr. E. Oliver transmitted from Bruges a collection of various agricultural notices.—The Council ordered their usual acknowledgements for the favour of these communications.

The meetings of the Council stand adjourned, over the Autumn recess, to the first Wednesday in November.

THE BENEFICIAL INVESTMENT OF CAPITAL IN LAND.

The problem to be solved in the establishment of agricultural banks is to devise a system by which accommodation analogous to that enjoyed by the commercial classes, but for the longer periods which agriculture requires, may be afforded to the agricultural interest; and at the same time to confine this accommodation to the legitimate purposes of farming, and to discourage injurious speculation. No machinery appears better calculated for this than the cash credit system of Scotland. In that country a person wishing to take a farm beyond the compass of his own means has but to keep an account with one of the joint stock banks, and to offer the personal security of two friends for the repayment of advances, and, if the managers approve of the security, he is allowed to overdraw his account to the amount required. The improved cultivation of Scotland has been effected mainly by means of these cash credits, and the want of success which so frequently attends Scottish farmers who settle in England arises, in a great measure, from the absence of those facilities for obtaining accommodation which they would have enjoyed in their own country. They are, therefore, often deceived in their estimates of the amount of capital required for a farm of a given size in England. We could point to a remarkable case of this kind, which led to an expensive lawsuit between a landowner in England and a farmer from Scotland, who had entered into an agreement for a lease of a farm at a moderate rent, possessing capital of his own which would have been sufficient in Scotland for a farm of the same size with the aid of the accommodation the banks would have afforded him. After having occupied it a year, and sunk a large sum on improvements by draining, &c., he applied to the bank of the district for a cash credit, which was refused. Finding the difficulties in which he was involved, he attempted to extricate himself by throwing up the farm; which led to litigation, eventually terminated by arbitration, under which the landowner took back the farm, and paid for the permanent improvements. Objections are raised against the cash-credit system by the lovers of routine in banking, precisely similar to those raised by our friend Mr. Flail against the introduction into one district of improved processes of cultivation which have stood the test of long experience in another. These objections are—"It may do *there*, but it will not do *here*. Scotch banking may be all very well north of the Tweed, but it will not answer in the south." In the first place the Scottish banks can issue one pound notes, and without them it is alleged they would not be able to make these advances. It could not be done with hard cash. The failure of certain joint stock banks, established professedly on the Scotch system in England, and the disastrous consequences resulting from the reckless manner in which they allowed accounts to be overdrawn, and the wild speculation to which it led, are urged as another objection. Whatever weight the argument respecting one pound notes may have had formerly, when gold was scarce and the Bank of England had difficulty in retaining in its coffers gold to the extent of one third of their issues, it falls to the ground now, when California and Australia are over-

whelming us with their "dust," and when the stock of bullion in the bank is increasing so rapidly that, before long, it will amount, in all probability, to the full value of the notes issued. It must be remembered, again, with respect to the English Joint Stock Banks which failed, that they adopted only one half of the Scottish system, and rejected the other. They allowed a few individuals to overdraw their accounts to an enormous extent, for building and railway speculations, without taking the securities which the banks in Scotland require. To be obliged to find two friends willing to be bound for a man is in itself a great check on imprudent borrowing; and after the loan has been obtained these two securities exercise a salutary surveillance over him, in conjunction with the bank. If the managers see, from the nature of the transactions, that the loan is not being applied *bonâ fide* to the purposes of farming, they intimate as much to the securities; and, on the other hand, if the securities disapprove of the proceedings of their friend, they give notice to the bank and close the account, to relieve them from their responsibility.

We contend, then, that the establishment of agricultural banks, receiving deposits as a permanent investment, or with an engagement that it shall not be withdrawn for a certain number of years, would exert a beneficial influence on English agriculture, would afford to the shareholders and depositors a higher rate of interest than they can obtain in the funds, and would form as safe an investment for capital as the Scottish banks.

We have elsewhere recommended capitalists, having a certain sum for investment in land, to expend part only in the purchase of poor land, and the remainder in executing permanent improvements on it—in preference to embarking the whole in high-rented land of superior natural quality.

It is objected that in the backward districts where such improveable estates are to be found, there would be difficulty in finding tenants with the requisite skill and capital to give full effect by an improved cultivation to the landlord's outlay. There are, however, plenty of rising young men, practically conversant with the best eystems of farming, and sufficiently enlightened to judge of the merits of still more modern improvements, and to adopt them without prejudice, if suitable to their locality. A monied man purchasing an improveable estate, by a careful selection of steady and industrious men of this class as tenants, might employ part of his capital advantageously by advancing them the funds necessary to give effect to their skill. T.

CALENDAR OF HORTICULTURE.

Plant-Houses.

The prevalence of so much rainy weather of late should have induced a corresponding degree of attention to ward off its injurious attacks from all greenhouse plants standing out of doors for the purpose of hardening and maturing the wood. As this process approaches perfection, the quantity of water to the roots must be gradually lessened, hence it is obvious that to leave them exposed to all the rain must be injurious, and therefore either a waterproof covering must be applied, or else the pots laid on their side when it rains. By far the best plan, both as regards the welfare of the plants and the facility of accomplishment, is to have an erection on the plan of a tulip frame, with waterproof canvass and rollers: with care, this would last many years. Some of the early forced Azaleas will have set their bloom buds and ripened the wood, if they have been properly exposed; they may, therefore, be top-dressed and removed to the greenhouse, when the foliage is perpectly dry. The same remarks will apply to the Camellias required for early flowering, which should be housed at once: the later ones may be left out for some time yet. The winter flowering Heaths and Epacrises must have all the exposure possible, by the entire removal of the lights on fine days. Heaths, in all stages of growth, should now be standing in cold pits; and such as have been recently cut in, after flowering, may be kept rather close and shaded when necessary. As soon as the growth commences, inure them to perfect exposure in common with the general stock, as the completion of the growth under such circumstances is generally more favourable to abundance of flower and dwarf stocky habit. I have seen beautiful young plants from a celebrated Heath nursery, which had been pushed on to grow very fast at this season by close moist air and shading, and being sent out in that state were placed where they got free ventilation and a drier atmosphere, in a few days the beautiful green became a dusky-brown, and much of the foliage fell off. Nurserymen would do well to send a notice with such plants that they had been kept rather close, and that the change to the opposite extreme must be gradual. Such might not be necessary to gardeners who are presumed to understand the cultivation of these charming plants; but there are many lovers and purchasers of Heaths, who are not so deep in the philosophy of inuring plants to submit to varying atmospherical influences as we practicals are obliged to be. Chrysanthemums must have every attention paid to watering, and the application of liquid manure; the strongest will be ready to be secured to a neat stake; take care that the whole stock are thus timely secured, as they are liable at this season to be blown about by the autumn gales. See that the layers in the border do not want for water and liquid manure when well rooted.

Forcing-Houses.

Pineries. — See that previous directions are fully

carried out, both as regards shifting and bringing forward the succession plants in the various stages of growth, and also in supplying them freely with liquid manure, air moisture, and a great abundance of ventilation, to ensure a stocky growth. Continue to pot the strongest suckers as they become ready. Great caution must be used in syringing plants just showing fruit: they should not be syringed over head until the fruit is well set. Apply water and liquid manure to the roots, and syringe all over the surface of the bed and the base of the plants. Attend to the bottom heat, which, for plants in this stage, must not be allowed to decline.

Vineries.—The late Vines should be assisted with a little fire heat at this season, to perfect the fruit and to assist in the ripening of the wood. Keep them clear of all superfluous growth, and let them have a free circulation of air. See that there is sufficient moisture at the roots to assist them up to the colouring point; moisture in the air must be kept down rather than encouraged, as it will only excite a tendency to make late growth. Continue the removal of mouldy berries from the ripe grapes. They will now also require to be protected from the attacks of wasps and flies. The plan of putting bags over each bunch separately is not a good one, as it rubs off the bloom and induces decay in the bunches; I therefore recommend, as cheaper and less troublesome, to nail the elastic hexagon netting over all the ventilators, using the strong tape round the edges, as before recommended.

Pits and Frames.—See that a considerable quantity of fermenting materials are kept in a constant course of preparation for the formation of new beds, and to keep up the bottom heat in Cucumber frames intended for autumn and winter fruiting, for which purpose the linings will require almost as much attention as in early spring. Late Melons should also have a renewal of linings. Prepare also materials for successional beds of Mushrooms, and spawn such as are at the right temperature. See that the casings do not get too dry: a slight sprinkling of water now and then will do much good, but avoid saturation.

Hardy Fruit Garden.

Wasps are abundant and troublesome, and means must be used to prevent them spoiling the best fruits, either by covering with canvass, or hexagon net, or else covering individual fruits separately. Cotton wadding is very good for securing Peaches, Nectarines, &c., and will also do for Figs; but the latter are better covered with small bags; without some such precaution, it is difficult to get a thoroughly ripe fig. Nailing and preventive pruning must still be practised on wall trees of all sorts, as they will continue to grow for some time yet; and if not kept well nailed, are often much blown about by the autumn gales. Gooseberries and Currants, which are covered with mats, should be opened now and then on fine days, to dry off the damp.

Kitchen Garden.

Commence earthing up the early Celery: choose a dry day, and remove all suckers and useless leaves. Stir the soil amongst all advancing crops of Cauliflower and Broccoli for autumn use, and also amongst the general crops to stand the winter. Thin out the winter Spinach bed in time, and keep the surface stirred. Plant out more Endive and Bath Cos Lettuce. Sow Hardy Hammersmith Lettuce on sloping banks or under the shelter of a south wall, to stand in the seed bed through the winter. Proceed with the lifting and storing of Potatoes. Such as are intended for seed next year, should be spread out thin to get quite green. Most of the haulm has ripened off prematurely this season, but amongst those planted in January and February I do not find a half peck of diseased tubers in a sack. Later planted ones, I fear, will be worse: we shall soon see.—C.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR AUGUST.

During the early part of this month, and up to about the 20th, large quantities of rain fell in most parts of the United Kingdom, but more especially in the Southern, Eastern, Western, and Midland districts. From the fact—and which by the way is calculated to somewhat reduce the acreable yield—that the wheats ripened prematurely in many quarters, cutting was of necessity commenced earlier than usual: hence, immense breadths of wheat were exposed to a damp and changeable atmosphere for at least ten days or a fortnight longer than was the case in 1851. The damage thus sustained by the crop has been extensive; and, in numerous instances, very heavy losses have resulted from the wheats having become matted and grown—sprouts of from two to three inches in length being observable upon many sheaves. In addition to this calamity, blight and mildew have considerably affected the condition and weight of the crop, although we are of opinion that the rains have caused more damage than either of the latter causes. It must be observed, however, that these remarks apply chiefly to the state of matters south of the Humber, and that they cannot be considered as applicable to every district. The quarters which have suffered most are the fens of Cambridgeshire, and the greater portion of Wiltshire, Sussex, Surrey, and most of the Midland Counties. From

the North our accounts are unquestionably of a more favourable character, notwithstanding that the season there has been what may be considered a forward one. We have now to inquire what amount of damage has in reality been sustained. Upon this point growers and dealers differ materially; but our opinion is that the loss has in many instances been greatly exaggerated, although, judging from the state of the samples exhibited at Mark Lane and elsewhere, it is evident that, in numerous instances, one-sixth of the wheats have been so damaged as to make it a matter of difficulty to obtain purchasers for them at almost any price. In forming an estimate of the loss, we must not forget that, at one time, the yield promised to be considerably *over* an average; hence it is fair to assume that the aggregate return—allowing of course, for the comparatively abundant crops in the North—will be about one million quarters short of 1851, in which year the produce was immense. Our premises then are these: the growth of wheat is nearly an average one, but with quality greatly inferior to that of many preceding seasons. As might be anticipated, the corn trade has been in an excited state, and the prices of wheat have advanced from 4s. to 5s. per qr. The return of fine weather, and the favourable advices from Scotland, have lately operated against the trade, and the improvement just noticed has been with difficulty supported. At Mark Lane new red wheat has sold at from 35s. to 44s., and red 42s. to 50s. per qr.; whilst the weight of the samples has varied from 56 to 63 lbs. per bushel. The quantity received from Essex and Kent has amounted to 2,000 qrs. Respecting the crop of barley, we may observe that it is a good one as to quantity, but very deficient in quality; whilst it is evident that a great scarcity of really fine malting parcels will be experienced during the whole of the season. The quantity sprouted and valueless is much smaller than had been calculated upon. Oats have come forward rapidly. The straw has turned out long, and the quantity of corn grown is much larger than for some years past; but it is evident that beans have turned out a complete failure in nearly all parts of the country. The yield of peas is turning out well.

The early seed grasses and seeds are abundant in quantity, whilst their quality has not been materially injured by the dampness of the weather. The second-cut of both meadow and clover hay is likely to prove unusually abundant; indeed, in many quarters, we have seen the swathe nearly equal to the first cut, particularly on strong lands. The demand for both hay and straw has ruled tolerably steady, and prices have been well supported, owing chiefly to the supplies having been moderate, from the farmers being much occupied in the fields.

It has been a general subject of remark that labour has been unusually scarce all over the kingdom—the emigration to the United States, Australia, &c., having carried away an immense number of able-bodied labourers. Judging from the rate at which it is now going on, we should incline to the opinion that the evil will increase, and that wages must rise in proportion.

Very conflicting accounts have continued to arrive on the subject of the potato disease. On the one hand, we are informed that nearly the whole of the crop has been lost: on the other that the growth is fully expected to be a good one. Now, it is clear that superabundant moisture must prove prejudicial to the crop, and that warm dry weather is now required to bring it to maturity. Up to the present time, very large quantities have been disposed of, in the various markets, in excellent condition; and we have heard from the best authorities that the damage as yet sustained is trifling. It is true that the haulm has exhibited signs of decay; but we find that the tubers, when raised, have mostly escaped the disease. We contend, therefore, that the actual losses will not have any material influence upon the value of the better kinds of food. The turnip and carrot crops have been looking remarkably healthy and forward, although the season has not been considered a very favourable one. The weight of swedes expected to be pulled this year is large. The cattle markets have ruled steady at full quotations. Store animals have commanded rather high rates, notwithstanding the increase in the inports of stock from Holland and elsewhere. The business doing in cakes has not been extensive, yet prices have ruled steady, and the large arrivals of linseed from India and the Black Sea continue to find buyers, at steady rates.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Most of the markets held during the month just concluded have been somewhat liberally supplied with fat stock as to number, but the general condition of the beasts and sheep brought forward has been beneath the usual average at this period of the year. The weight of the stock having been by no means heavy, and store animals having realized rather a high figure, the demand has improved, and, in some instances, prices have had an upward tendency. Hitherto, the beasts received from Lincolnshire for the metropolitan market have been, for the most part, unfit for first-rate butchers; hence, the value of the best Scots has ruled much higher in proportion to the short-horns and most other breeds. We attribute this circumstance

chiefly to the long-continuance of dry weather in the early part of the year, and the limited quantitise of cake consumed upon most of the farms in the north. There are one or two features in the trade at this moment which require particular notice, and which may serve to illustrate the workings of free-trade. In the first place, it is certain that the production of English stock is not increasing, and that it is far beneath actual consumption. How is this? Simply because the foreigner is consiberably underselling the English grazier. Let us give an instance. Since we last wrote, the total number of calves disposed of in Smithfield has amounted to 3,350 head, out of which 2,867 were foreigners—thereby showing that only 483 were English! As regards value, we may intimate that the Dutch calves—most of which have turned out well—have produced no more than from 2s. 8d. to 3s. 2d. per 8 lbs., whilst the English have sold at from 3s. 4d. to 4s. Now, it must be obvious that when the butchers—many of whom, by the way, are bad judges of live calves—can purchase fair average foreign qualities at the prices given above, they will continue to favour the Dutch rather than the English producers; hence, from being so completely undersold in their own markets, numerous calf-rearers in Essex, Surrey, and elsewhere have wholly abandoned the system, and turned their attention to other matters, possibly more profitable to them. Had the supply of home-reared calves increased in the same ratio as that of foreign, prices must, unquestionably, have gone considerably lower. As it is, the trade has been completely annihilated. The same remarks may, to a great extent, be applied to both beasts and sheep; whilst, judging from the increasing imports, we are very apprehensive that a lasting injury has been inflicted upon the property of our graziers. It has been asserted that the importations are chiefly for the purpose of breeding, and consequently that the agricultural body are deriving great benefits from the law permitting the free import of foreign stock. A more absurd and ridiculous statement has never, we believe, been published; for all acquainted with the subject are aware that at least nineteen-twentieths of the stock imported pass immediately into the hands of the butchers. Experiments have, it is true, been made for the purpose of ascertaining whether it is possible to fatten foreign beasts and sheep in this country at a profit; but the result has almost invariably proved a heavy loss. We may observe, further, that English sheep in a half-fat state have been purchased and forwarded to Holland, and from thence re-shipped to London in a greatly improved state. This system, however, is not likely to be carried on to any extent, owing to the expenses of transit. The Dutch sheep continue to improve both in weight and quality. In proof of that statement, we have seen numbers of them sold in Smithfield, at 41s. each, equal to 3s. 8d. per 8 lbs. The following are the arrivals into London, during the month:—

	Head.
Beasts	5,316
Sheep	23,623
Lambs	3,576
Calves	2,867
Pigs	1,856

IMPORTS AT CORRESPONDING PERIODS.

Aug.	Beasts	Sheep	Lambs	Calves	Pigs
1847....	4,185	18,489	874	1,942	—
1848....	2,526	14,266	871	2,135	—
1849....	2,913	15,981	1,179	1,000	302
1850....	4,277	17,376	2,370	1,945	581
1851....	5,342	24,342	4,431	2,569	2009

At the outports the supplies have not increased, but two cargoes have arrived at Portsmouth from Oporto in excellent condition, the value of the beasts being from £19 to £21 each; yet they have not paid the importers anything like the original cost, and other expenses.

The total supplies of English and foreign stock exhibited in Smithfield have been as under.

	Head.
Beasts	21,049
Cows	620
Sheep and lambs	165,770
Calves	3,350
Pigs	2,785

STOCK SHOWN AT CORRESPONDING PERIODS.

	1847.	1848.	1849.	1850.	1851.
Beasts	19,073	17,975	18,133	19,390	20,317
Cows	878	497	454	475	450
Sheep and lambs	225,390	153,280	173,620	181,490	181,900
Calves	3,860	3,840	2,480	2,348	2,648
Pigs	2,227	2,443	2,200	2,291	2,732

The bullock droves from Lincolnshire, Leicestershire, and Northamptonshire, have amounted to 10,150 Short-horns; and from other parts of England, 1,900 of various breeds. The supply from Scotland has been confined to 358 Scots.

Beef has sold at from 2s. 4d. to 4s; mutton, 2s. 6d. to 4s. 2d.; lamb, 4s. to 5s. 2d.; veal, 2s. 8d. to 4s.; and pork, 2s. 6d. to 3s. 6d. per 8lbs. to sink the offals.

COMPARISON OF PRICES.

	Aug., 1848.	Aug., 1849.
	s. d. s. d.	s. d. s. d.
Beef .. from	2 10 to 4 4	2 8 to 2 10
Mutton	3 10 to 5 0	2 10 to 4 0
Lamb	4 0 to 5 2	4 0 to 5 0
Veal.....	3 6 to 4 2	3 0 to 3 6
Pork	3 8 to 4 6	3 2 to 4 0
	Aug., 1850.	**Aug., 1851.**
	s. d. s. d.	s. d. s. d.
Beef .. from	2 6 to 2 10	2 4 to 3 6
Mutton	3 2 to 4 2	2 10 to 3 10
Lamb	3 6 to 4 6	3 10 to 4 10
Veal.....	3 0 to 4 0	2 4 to 3 6
Pork	3 2 to 4 0	2 4 to 3 8

The pastures being plentifully supplied with grass, the stock has fared remarkably well, and we have heard very few complaints of the disease in cattle, or foot-rot in sheep. The consumption of cake has not increased.

The demand for each kind of meat in Newgate and Leadenhall has ruled steady, as follows:—Beef, from 2s. 2d. to 3s. 4d.; mutton, 2s. 6d. to 4s.; lamb, 4s. to 5s.; veal 2s. 8d. to 3s. 10d.; pork 2s. 4d. to 3s. 6d. per 8lbs by the carcass.

CAMBRIDGESHIRE.

The alarming state of things in our rural districts precludes our waiting to the end of the month to give our report. No thoughtful man can, we presume, longer doubt that we are now suffering under a serious visitation of Divine Providence; of which the blight and mildew with which many of our crops have been so severely smitten, followed by the almost unprecedented wet weather in the midst of the harvest, seems but the strongest corroboration. We have occasionally seen failing crops and rainy seasons in the time of harvest; but never, for the last fifty years, have we witnessed the crops so greatly damaged, or the British husbandman's prospects so thoroughly disheartening. We just remember the harvest of 1800, when, after a most fearful thunder-storm, attended with tremendous rains and a very hot and sultry atmosphere, the corn sprouted in the fields, whether cut or uncut, perhaps more than it has done within the last ten days; since which, we do not recollect so disastrous a season. In the former case, a greater portion of the harvest was secured before the rains set in; whereas in the present season the heavier crops very largely are not merely beaten flat upon the ground, but present the most dead and dingy appearance, with a meagre shrivelled kernel, shut up in the chaff in a way that almost defies any thrashing-instrument to get it out. And where the corn is reaped, so incessant have been the rains that the sheaves are so thoroughly saturated that the grain has shot out, in close and sheltered spots, most awfully; and, in a greater or less degree, in nearly all situations. The same may be said of barley. There can be none of fine quality, and the great bulk will be miserably bad. Our meadows are covered with water; and the farm roads present the appearance of winter. The barometer has now risen considerably: it may be merely the effect of the northerly wind. The smoke still descends to the earth; and as yet there appears but little chance of fine weather. There was a time when such calamities fell perhaps heavier upon the consumer than on the grower of corn; but with open ports to all the world, free of duties, the British grower has no security but that he may have to compete as extensively as ever with grain from abroad of fine quality, rendering his own damaged produce nearly unsaleable in the market. No wonder then, that our farmers, under these perplexing and overwhelming difficulties, should feel considerable discomfiture. They will do well, however, to bear up with fortitude and still do their best, leaving the issue in the hands of an all-wise and still merciful Providence; not forgetting that it is far better to fall into the hands of God than unreasonable men. Of the latter they have had ample experience within the last few years. There is one question, however, that cannot fail to have become most pertinent—Will our rulers have the hardihood to continue, under present circumstances, that grievous impost the malt-tax? Grievous and annoying to the farmer at the best, that he may not use the article he grows for himself and labourers without something like a cent. per cent. tax upon it; but doubly grievous in a season like the present, when, from causes over which he has had no control, more than half his crop while bearing such an impost is rendered unavailable for malting purposes; but rid of which, that very barley would bear a fair price in the market. Surely, if the term "farmers' friend" is not an utter cheat, with a free-trade in corn, the malt-tax can never survive a season like the present.——Since writing the above, we have extensively examined several wheat and barley fields, and we have not found a shock of wheat that is not, more or less, sprouted; the white wheat in particular is nearly all started, and in many cases has shot the blade quite out green. The barley is nearly as bad in the swath, and that uncut where lodged, is grown quite as bad as that mown. The rain has also set in again in fearful earnest.—Aug. 20.

SOMERSETSHIRE.

During more than two weeks we have had but one day without rain in this part of the county; but the fall of rain, except on the 10th and 14th, which was general, and lasted very heavily from six to ten hours, has been very partial; there was a very heavy thunderstorm in the county on the evening of the 13th and morning of the 14th, whilst it was fine all the day here; there were heavy thunderstorms last evening, but partial; the glass has been rising steadily, but slowly. Portions of our best wheat are harvested, but very little indeed in a condition for grinding. On sandy soils and on strong late soils the rust has much lessened the quantity and quality of the crop; on the moor there are not 20 bushels of inferior wheat where 40 might have been; we should fully estimate the crop six bushels per acre, and taking quality into the estimate, eight to ten bushels per acre, under last year on our average growth, and a good deal must be wasted in grinding it. The oats, laid as they are cut, have been much injured, and in close situations so grown out that sheaves have had to be taken abroad again. The barley is spoken of as a splendid crop if it can be well taken, and the quality good. Peas have suffered much in harvesting. The winter beans cut may come in in fair condition, and prove an average crop. Some of our fine meadows have been under water, and care must be taken or we shall have unsound sheep. Harvest operations are put two weeks behind what they would have been had there been dry weather; as it is, even in this county, we shall break into the next month before it is generally secured. On Mendip and the high land reaping is just about commencing, so they will be able to progress more favourably. Prices have run up during the rain from 5s. 6d. to 6s. 6d. the best white; it is pretty generally observed that the stock of old is short, and as the quality is very superior to any new we shall have, it is held firmly. Beans for local consumption fetch 5s. per bush., and vetches 5s. to 5s. 9d. Wool 12½d. to 13½d. per lb., and a great deal sold. Sheep are higher, and fat stock sells rather better.—Aug. 21.

NORTHAMPTONSHIRE.

Since forwarding my last report for this county, we have experienced some very unfavourable harvest weather. Rain commenced on the 7th, and has continued very wet ever since —the 12th and 13th being both exceedingly wet; also on the night of the 16th considerable rain fell, flooding the meadows and lowlands of the county. Considerable injury is done to the wheats standing in the shook, owing to the weather having been showery during the process of reaping; many sheaves have been tied up damp, and are growing fast at the bands, while all the heavy crops uncut have grown, owing to the ears lying closely to the wet ground We there-

fore must expect an inferior sample, with much sprouted corn. A very considerable proportion of barley is mown, and has become very dark coloured, with a proportion of it growing daily. Oats are also much stained, and great loss will be incurred by shedding out. Peas and vetches are getting completely rotten, the fodder spoiled, and a fourth part of the crop already sprouted. To-day has been very warm and showery, with a humid and heavy atmosphere, after a previous wet night. We are every day hoping for a finer and more seasonable change, and shall hail with pleasure the return of dry harvest weather. Labourers are scarce, and high prices are given for labour.—Aug. 20.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASHBOURN FAIR.—The show of horses was better than we have seen at late fairs, and useful animals sold well. Cows were very limited—we do not remember having seen so small a show for some years—calving cows realized high prices. Sheep were plentiful, both fat and store; both met with a tolerably good sale.

ATTLEBOROUGH FAIR.—Business had a less active appearance than at Thetford on Monday. Still the confidence of the sellers of both beasts and sheep has in no manner diminished; although the supply was large, previous prices were fully supported. There was a slow demand for milch and in-calf Cows, and prices were a shade lower. The sale for young horses was good, at high prices. The pig trade was slow, but previous prices were supported. Small calves in good demand, at improved prices.

BANBURY FAIR.—There was a large supply of stock, and the town was thronged with agriculturists. The business effected was tolerably extensive, and good prices were realized. A sale of 24 rams, from the celebrated flock of Mr. Alban Bull, of Drayton, took place in the horse fair by Mr. Cother, which were disposed of at good prices, the average being £7 10s. each.

BAMPTON FAIR.—Dealers are here from all parts of the kingdom, and a very good supply of horses of a high class, suited for carriages, which met a ready sale.

BRAITON DEVON FAIR.—There was a large supply of the pure North Devon breed of cattle exhibited. We noticed a superior drove of steers, the property of Mr. Crang, of Whitefield Barton. A prime lot of heifers, property of Mr. Crang, Narracott. Mr. Ridd, of Brattou, produced a fine drove of pure Devons. Cows and calves fetched from £10 to £13; two-year-old steers, £10 to £14 the pair; three-year-old and upwards, £14 to £32 the pair; fat bullocks, 8s. to 8s. 6d. per score; fine heifers, 5s. 6d. to 6s. 9d. ditto. The sheep fair was largely supplied, and the demand brisk. Mr. Harris, Bittadon, realized 35s. a-head for a fine lot of horned Exmoor ewes. Store wethers, 22s. to 33s.; fat ditto, 5d. per lb.; woolled lambs, 6d. per lb. There was a good deal of business transacted at remunerating prices.

HORNCASTLE GREAT HORSE FAIR.—This great mart for horses is now being nearly brought to a close. Buyers have been plentiful for good animals, and first-rate horses were eagerly sought for at extraordinary prices. Hunters and park horses have fetched £100 to £200 each, and in two or three instances higher prices than these were obtained. Carriage horses, well matched, £180 to £300 per pair. Ready customers for good horses are always found at this fair. Superior dray horses, £50 to £60 each, and if well matched they realized more money. Hacks and harness horses, £25 to £30, and if superior, £40 to £50. Fancy ponies were scarce, and fetched high prices. Messrs. Potter, of Melton Mowbray, brought 46 Irish trained hunters; they found customers for nearly the whole, at good prices. Large arrivals and a good demand have continued throughout the fair. Colonel Wingfield, of the Royal Horse Artillery, Colonel Lawrenson, of the 17th Lancers, Colonel Shewell, of the 8th, Mr. Jex, of the Greys, and Colonel Moore, of the 6th, are buying large numbers for their respective regiments; and Colouel Mundy and Captains Drakes and Fell are also purchasing for the army. This is the largest fair we have witnessed for the last ten years.—*Stamford Mercury.*

CRIEFF.—MONZIE MARKET.—The show of lambs was about the usual average; prices very high. Small animals that used to sell about two shillings brought five, and met with a ready sale; others, of a superior quality, brought from ten to fourteen shillings; altogether there has not been such a good market for many years. The market for general business, the day after in Crieff, was but thinly attended, owing to the advanced state of the crops, and very little business was consequently done. A large number of pigs were in the market, and sold at good prices, varying from six to twelve shillings, according to age and quality.

GLOUCESTER CHEESE FAIR.—The quantity pitched was greater than on any former occasion, being about 150 tons, the whole of which was speedily sold at satisfactory prices, there being a good attendance of both buyers and sellers. The prices ranged, for seconds, from 34s. to 38s.; for best single Gloucester, from 42s. to 44s.; best double, 46s. to 48s. per cwt.

HIGHLAND LAMB MARKETS.—There was a lamb market on Monday on the Muir of Alvie, Badenoch, and another on the following day in Kingussie. Prices were high; indeed, such was the demand, that any price asked could have been obtained. There was a very keen competition. Shots were bringing from 4s. to 5s., and tup lambs from 6s. to 8s.

HUNGERFORD SHEEP FAIR.—There was a good attendance of buyers, and a fair supply of sheep, for which high prices were obtained.

KNARESBRO' FAIR.—The attendance of buyers was numerous, but the quantity of stock shown being rather limited, and not of good quality, less business was transacted than might have been expected from such an assemblage of buyers; but we doubt not the demand for better stock will be responded to shortly.

LEEDS, Aug. 17.—There was only a moderate supply, which sold at from 7½d. to 9½d. per score of 21 lbs.

LELANT FAIR.—The wet weather greatly interfered with business. The price of fat cattle was from 48s. to 50s. per cwt., and of lean cattle from 30s. to 35s. per cwt.

LINCOLN FAT STOCK MARKET.—There was a small show of both beasts and sheep, and everything was readily bought up at advanced prices. Beef realized 5s. 6d. to 6s. per stone, and mutton 5½d. to 6d. per lb.

LISKEARD FAIR was largely supplied with sheep and bullocks, but the sale was dull at a small decline in prices.

LOCKERBIE LAMB FAIR.—The stock was, as near as could be estimated, about an average, numbering about 60,000, but the quality was decidedly better than last year. The stock was principally composed of half-breds and Cheviots, with a few lots of three-parts. The buyers were very numerous from all quarters of the country, more especially after the arrival of the special trains advertised for that day in consequence of the fair. The stock was very anxiously looked after, and carefully examined in the early part of the morning, when a few sales were effected; but after the arrival of the trains mentioned above, business got on rapidly, and by eleven o'clock about half the stock was disposed of. The stock shown at this fair is considered of a better class of sheep than those that are brought to the Melrose and St Boswell markets, being, generally speaking, of a stronger description. Good Cheviot lambs, particularly wethers, were very readily picked up; also the half-bred lambs, the former at an advance of 2s. above last year's prices, and the latter description about the same advance; and crosses about 1s. 6d. Although the prices obtained here may appear higher than what was got at Melrose, the advance was much about the same, when the nature of the stock is taken into consideration. The few lots of three-part bred lambs that came under our observation brought a similar advance to that obtained at St. Boswell's and Melrose. Between eleven and twelve vast numbers left the ground. Many parties who came here to purchase, had they known the rise obtained at Melrose, would not have attended this market to-day, but were ultimately reluctantly compelled to make their purchases. We do not think, by three o'clock, a single lot was left unsold. The general stock looked uncommonly fine from

the favourable state of the weather to-day. The following are the averages: Half-bred lambs, from 16s. to 23s.; crosses, from 11s. to 16s.; Cheviots, from 9s. to 15s.

LOUGHBOROUGH FAIR was very thinly attended. Milch cows and store stock sold pretty readily at tolerably good prices, but fat stock were a drug, some of them remaining on hand until late in the day. The horse fair was large, but the animals shown were all of an ordinary description. There was a large attendance of screw dealers, and the business transacted was principally amongst animals they exhibited.

LUDLOW FAIR.—A large supply of sheep and store animals realized high prices. Fat mutton made fully 6d. per lb. A good show of pigs, which fetched high prices. The supply of beasts was rather small, and, there being a great number of dealers in the fair, an advance in price was the result. Beef averaged 5½d. per lb. Good horses in demand, at very satisfactory rates.

MARLBOROUGH FAIR.—About the usual number of sheep and lambs were penned, for which there was a good trade, at prices not equal to Britford, but better than at "Tan Hill." The best ewes fetched from 28s. to 35s.; the best lambs from 20s. to 25s.; wethers, from 28s. to 37s. The highest figures, however, were for choice lots. Mr. Hillier Reeves, as usual, exhibited some good cart colts.

MELROSE FAIR.—The stock was fully an average one, and the quality was allowed to be better than last year. The number of buyers was also very numerous. The show of Cheviot lambs was rather short in point of number, many sales amongst known lots of this description having been effected the night previous with reference to a market price. In a few solitary instances a rise of 1s. a head was obtained over St. Boswell's market, but this should not be taken as any criterion of this market. Cheviot lambs were about 2s. a head higher than last year, and half-bred and three-parts averaged a rise of from 1s. 6d. to 2s. At the close of the market an effectual clearance was made of all kinds; and we do not believe a single sheep was left unsold. It was considered, upon the whole, to be a capital market. The following are a few of the many sales effected:—HALF-BRED LAMBS.—A lot of 200 from Minto, going to the Earl of Rosslyn, Fifeshire, at 16s. A lot of Ewes and Wethers from Spittal, near Hawick, at 16s. 9d. Mr. Binnie, Easter-house, Byres, sold his lot of eight score to Mr. Bell, Town-head, Gifford, at 18s. Mr. Cossar, Mosshouses, sold his Wethers at 18s. and his Ewes at 16s. 9d. The lot belonging to Mr. Dickson, Wedderley, brought 16s, and his greyfaced, 13s. 6d. THREE-PARTS BRED.—Mr. Tillie, Crookston Mains, sold his first-class Ewes and Wethers, at 20s.; and his second lot at 17s. 6d. A lot going to Greenlaw, Berwickshire, being the shots of the stock of Mr. Allan, Uplaw, brought 15s. 6d. Mr. Hogg, Glenderg, sold his ewes and wethers at 18s. 3d. Mr. Thomas Linton, Cortleferry Inn, disposed of his ewes and wethers at 18s.; and Mr. Stewart of Cortleferry sold his ewes and wethers at 14s. 9d. Cheviot lambs.—A large lot, going to Forfarshire, brought 12s. 6d. Mr. Forman, Duncraehill, bought the following three lots:—8 score and 15 shot wethers at 10s. 6d.; 21 score and 10 wethers at 14s.; and 18 score and 16 ewe lambs at 12s. A lot of 22 score of wethers, from Riskunip, brought 11s. 6d. Mr. Gibson, Shaws, Selkirkshire, sold 8 score of Ewes at 10s. 6d. Three lots of wethers, going to Forfarshire, at 10s., 10s. 6d., and 11s. Mr. Aitchison sold 28 score of the Penchirst wethers at 14s. 6d. A lot of wethers from Buccleuch brought 12s. 6d.

MUIR OF ORD MARKET.—There was a large show of West Highland beasts, but very few sales occurred. In sheep there was a considerable show of shot Cheviot lambs; but with few exceptions they were of inferior quality, although a few were sold for good prices. For cross stots and queys the high prices demanded interrupted sales, although there was a great desire on the part of purchasers to make transactions. Of cows the show as to numbers was considerable, but the purchases were very limited; if, indeed, the sales exceeded those reported. In the horse market about a hundred animals were shown, although the few sales made were entirely effected by the "tinkers," who seemed particularly inclined to effect "swaps." The opinion of purchasers as to the market was that farmers asked too high prices, stating as their reason for doing so that the Falkirk market of last week warranted their increasing demands; and that the Aberdeenshire dealers were inclined to purchase largely on account of the superior hay crops in that county. Of the transactions which occurred the following are the principal:—A lot of two-year-old Highland queys, at 3*l.* 15s. each; a couple of superior cross stots, at 23*l.*; a lot of nine two-year-old cross stots, at 8*l.* each; a small lot of cross Highland stots, at 3*l.* 15s.; a lot of six quarter-old Highland beasts, at 3*l.* 3s.; a lot of thirty Highland queys, at 3*l.* 10s. each; and also a lot of twenty Highland stots, at 4*l.* each; and a lot of sixteen six-quarter-old crosses, on the way to the market, at 4*l.* 10s. each; a lot of Highland heifers, at 5*l.* 10s. each, said to be the best on the ground of their sort; a lot of six-quarter-old Highland stirks, at 3*l.* 1s. 6d. each; a lot of three-year old short-horn stots, at 7*l.* 15s. each; a lot of three-year-old Highlanders, at 5*l.* 10s. each; a lot of Highland queys were bought at 5*l.* each; a lot of Caithness three-year-old Stots forty in number), at 8*l.* 8s. each; a superior lot of three-year-old cross queys, 35*l.* We heard of several lots of Highland two-year-old stots and queys having been sold at from 3*l.* to 3*l.* 10s. each. In the sheep market were several lots of shot lambs. The earliest transactions we heard of were by Mr. S. M'Rae, Achmore, who sold 105 Cheviot lambs to Mr. Monro, Caithness, at 7s. 7½d. each. Mr. Fraser, Mauld, sold sixty shot Cheviot lambs, from Shieldaig, at 5s. 6d. each; and a lot of ditto, from Achingait, at 5s. 9d. each. Mr. Robertson sold Glencannich Cheviot wedder lambs, probably the best in the market, at 12*l.* the clad score. Mr. Duncan Grant, from Glenmoriston, sold shot Cheviot lambs at 8s. each. The general price for shot Cheviot lambs ranged from 5s. 6d. to 9s. each. A large quantity of the stock shown on the ground remained over till Thursday, on account of the high price asked by exposers. The prices obtained must be considered good.

NEW ROMNEY FAIR.—Average up to two o'clock:—

8,012 lambs	sold in 78 lots,	average	17s. 8d.
3,169 old sheep	48	„	„	25s. 0d.
364 ewe tags	10	„	„	26s. 3d.
669 wether ditto	16	„	„	27s. 0d.
256 two-year-old wethers	8	„	„	47s. 6d.
130 maiden barrens	6	„	„	38s. 0d.

12,600

This does not include Mr. Humphrey's flock, sold by auction in an adjoining field. Number of sheep and lambs penned, 19,000. There were also a number of horses at the fair, of an inferior sort, with a few exceptions.

NORTHAMPTON FAIR.—The abundance of aftermath has exercised a cheering influence in the trade of grazing stock of all kinds. The supply of store beasts was not equal to the demand; and of those offered, consisting of Shorthorns, Herefords, runts, and Devons, the quality was exceedingly good, the sellers in most instances having the turn of from 10s. to 15s. per head in their favour, and all was sold out an early hour. Cows, for dairy purposes, of the Yorkshire breed, were in good demand at £16 to £18 each. Suckling calves, 17s. to 27s. each. Quarter-old store pigs, 16s. to 20s. each. The supply of sheep was unusually short, and were easy to sell at improved prices; best wethers making 40s. each, wether lambs 20s. to 24s.; Leicester ewes, 28s. to 34s.; lambs 17s. to 20s. Cart horses, 5 years old, 40 to 50 guineas each; colts, 3 years old, 25 to 35 guineas; 2 years old, 18 to 25 guineas.

OSWESTRY FAIR was but thinly stocked, but the attendance of buyers was numerous. Beef fetched from 4½d. to 5d., according to quality; mutton, 5d. to 6d. Pigs considerably advanced.

IRISH FAIRS.—GARRICK.—The supply of stock was good. Beef, 37s. 4d. per cwt.; two-year-olds, £6 to £6 10s.; yearlings sold freely at £3 to £3 10s.; Lambs, 24s. to 27s.; mutton, 5½d. per lb.; graziers, £6 10s. to £9; store pigs in good demand, and sold at £1 to £2 10s. The supply of horses was small, and nearly all of an inferior quality. CLOUGHJORDAN.—Sheep, pigs, and milch cows realized a fair price. Pigs sold at 40s. per cwt. Milch cows from £5 to £9. Lambs from 22s to 25s. each. KERRY.—The recent fairs prove that there is a scarcity of stock among the farmers. This is evident from the increasing shortness of the supply offered for sale in the fair greens, notwithstanding the high prices offered for dairy and young cattle, and breeding sheep—prices altogether inconsistent with the present value of butter and of beef and mutton. At KILORGIN FAIR the supply of stock was small and the prices asked and held out for showed an advance of fully 20 per cent. on those that would not be refused a month previous.—*Kerry Post.*

METEOROLOGICAL DIARY.

Barometer.			Thermometer.			Wind and State.		Atmosphere.			Weath.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
July 23	30.16	30.06	52	74	63	E. S. E.	lively	cloudy	sun	fine	dry
24	29.95	29.88	59	73	64	East	lively	cloudy	sun	cloudy	dry
25	29.80	29.70	61	74	64	S.E., S.W.	gentle	cloudy	cloudy	cloudy	storm
26	29.70	29.71	62	75	65	W. by N., var.	calm	cloudy	fine	cloudy	storm
27	29.77	30.00	60	74	61	Easterly	gentle	cloudy	sun	fine	showery
28	30.00	30.06	58	74	65	N. Easterly	gentle	cloudy	sun	cloudy	dry
29	30.06	30.06	60	75	65	N. Easterly	gentle	cloudy	sun	fine	dry
30	30.06	30.06	55	74	61	N. W., S. Ey	gl. cm.	cloudy	sun	fine	dry
31	30.06	30.06	55	77	67	S. E., N. W.	lively	cloudy	sun	cloudy	dry
Aug. 1	30.08	30.00	58	78	68	West by N.	gentle	fine	sun	fine	dry
2	29.91	29.70	59	77	64	West by N.	gentle	fine	sun	fine	dry
3	29.55	29.33	58	67	55	S. West	lively	cloudy	cloudy	cloudy	showery
4	29.33	29.43	53	68	58	S. West	gentle	fine	sun	fine	showery
5	29.49	29.47	54	72	59	S. West	gentle	fine	sun	cloudy	showery
6	29.47	29.37	52	66	59	S. West	strong	fine	fine	cloudy	rain
7	29.38	29.38	56	70	59	S. West	lively	cloudy	fine	fine	showery
8	29.43	29.49	56	70	59	W. S. W.	brisk	fine	sun	fine	hint r.
9	29.49	29.54	56	69	57	W. S. W.	gentle	fine	cloudy	fine	rain
10	29.60	29.64	52	68	58	Westerly	gentle	fine	cloudy	fine	rain
11	29.40	29.14	56	58	55	Easterly, S. W.	furious	cloudy	cloudy	cloudy	rain
12	29.27	29.50	54	62	57	West	brisk	cloudy	cloudy	cloudy	rain
13	29.60	29.75	55	69	57	West	gentle	fine	sun	fine	dry
14	29.77	29.68	52	72	59	W. S. W.	gentle	fine	sun	fine	dry
15	29.30	29.87	57	64	56	N. by West	gentle	cloudy	sun	fine	rain
16	29.97	29.97	51	67	58	S. West	lively	cloudy	cloudy	cloudy	rain
17	29.94	29.70	58	73	64	S. East	gentle	cloud	cloudy	cloudy	rain
18	29.70	29.87	60	74	60	W.byN.,S.Ely.	gentle	cloudy	cloudy	fine	dry
19	29.90	29.95	55	67	57	N. West	calm	fog	cloudy	haze	dry
20	29.99	30.03	56	64	60	N. by West	verygl.	cloudy	cloudy	cloudy	rain
21	30.13	30.20	58	70	63	N. by East	gentle	cloudy	sun	fine	dry
22	30.24	30.24	60	73	60	N. by East	lively	cloudy	sun	fine	dry
23	30.24	30.24	58	69	60	N. by East	gentle	cloudy	cloudy	fine	dry

ESTIMATED AVERAGES OF AUGUST.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.26	29.35	82	41	61.6

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
70.53	59.56	65.045

Weather and Phenomena.

July 23—Superb; changeable. 24—Heavy clouds. 25—Thunder and profuse rain. 26—Finer; a sprinkle. 27—Old Swithin; heavy clouds; clear P.M. 28—A fine afternoon. 29 and 30—Heavy cumulous masses. 31—Hot sun, close, and oppressive.

Lunation.—First quarter, 24th day, 1 h. 2 m. morning. Full moon, 31st day, 2h. 12m. morning.

August 1—Smoky atmosphere; cirro stratus. 2—Cheerful forenoon; hot; red sunset. 3—Weather broken up; close; showery. 4—Some distant thunder. 5—Changeable. 6—Early thunder and rain; rising wind. 7—Pretty fine, after rain in the night. 8—Fine harvest day; airy. 9—Gleams; several showers. 10—Cheerful till 2 P.M., then thunder. 11 and 12—Wet and windy. 13 and 14—Pretty fine and drying. 15—Violent wind, with rain. 16—Change; two strata of driving clouds. 17—Thundery; vast storms at 9 and 11 P.M.; lightning prodigious. 18—Threatning massive clouds; red sunset. 19—Hazy clouds day and night. 20—Drizzle. 21—finer; red sunset. 22—Fine drying air. 23—Smoky clouds; white fleecy cirro-cumuli late.

Remarks connected with Agriculture.—There can be no doubt that the vast and sudden heat of July affected the wheat just after the blossoming period, checked the maturation of the milky pulp, and contracted the grain. Hence the so-called blight. Subsequently the frequent rains and dashing thunder-storms soaked the shocks; and the warm vapourous atmosphere favoured the sprouting that had occurred in several places. The green crops improve much, and promise to be fine. Potatoes are again suffering.

Croydon. J. Towers.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF AUGUST.

We do not recollect a season for many years past, in which so great a change has taken place as that which has occurred during the month now about to terminate. When we last addressed our readers, the prospects for the harvest were of the most promising character: up to the end of July the reports from the agricultural districts were, almost without exception, of a satisfactory nature. The corn was fast approaching maturity; the weather appeared settled; and high expectations were entertained in regard to the quantity as well as the quality of the produce. Soon afterwards it began, however, to be discovered that the intense heat of July had caused premature ripeness in the wheat, and that many of the ears would therefore be but indifferently filled. Subsequently black blight manifested itself; and from these causes alone a material falling off was anticipated in the produce. The worse disaster was, however, still to come. The fine weather broke up just at the period when its continuance was of the greatest importance, viz., when the grain had become fully ripe. Heavy rain and high winds succeeded; the crops were beaten down, and lodged extensively. A great quantity of ripe corn was beaten out by the violence of the gales; but the most important loss is likely to accrue from sprout. Repeated heavy showers and a close temperature have caused the grain to grow in the ear to a greater extent than is remembered for years. This is an evil which cannot be avoided; and however propitious the remainder of the season may now prove, a large proportion of the new wheat and barley must inevitably be of very inferior quality.

The mischief has been much greater in the southern and forward parts of the kingdom, than in the north; indeed, the reports from Yorkshire and further north are thus far of a character to encourage the hope that the harvest might, with favourable weather, terminate tolerably well in that direction: but even with this redeeming point we cannot calculate on anything like a good average yield. The prospects for our farmers are therefore truly disheartening: the struggle to compete with the foreign growers has been sufficiently hard with good crops, such as those of last year: and how they are likely to fare under existing circumstances it is sad to contemplate. Prices may, and probably will, rule higher than they have done of late seasons, but this will be a very questionable benefit to the British farmer. Some time must elapse before the new grain can be fit for use. A large proportion of the wheat carried in damp condition will not be in suitable order for grinding before Christmas: long before that time our markets, if prices should hold out sufficient temptation, would be deluged with foreign wheat, and the rise would therefore be only beneficial to the foreign merchant and the speculator.

So large a proportion of the crop is still in the fields that it would be rash to pretend to give an estimate, at present, of the probable result: a great deal yet depends on the weather, and the market prices will for some time be entirely ruled by atmospherical influences. Harvest operations thus far have been tedious and expensive, for after an interval of a few dry days we have generally had a return of wet; a great quantity of the grain carried has been carted in a very unsatisfactory state; and the proportion remaining out, even in the most forward districts, is much larger than is usually the case at the corresponding period of the year. That the future should therefore be viewed with considerable doubt and apprehension is not surprising: latterly the weather has certainly undergone a decided improvement, and the rapid rise which took place in prices in the early part of the month has received a check. The total advance from the lowest point has been 5s. to 6s. per qr.: so important an improvement has naturally brought forward a good many sellers, and has at the same time caused purchasers to operate with caution.

During the first fortnight in August much excitement prevailed in the leading provincial, as well as in the metropolitan markets. This has since been more or less allayed: still the prevailing opinion is in favour of a further rise. That old wheat will be required extensively, for mixing with the soft and ill-conditioned new, cannot be questioned; and unless the receipts from abroad should be much larger than they are expected in the first instance to be, the former must inevitably command high prices. Those farmers who have any stocks of last year's produce remaining on hand may consequently profit in some measure by the rise; but this, we fear, will not be much benefit to the less-wealthy, who have long ere this been obliged to sell out.

Attention has of late been so exclusively directed to the state of the wheat crop, that it has become

difficult to obtain accurate information respecting the position of the other products of the earth. Even the potato disease—a subject of such intense interest a month ago—has been passed over almost without notice the last few weeks. At one period it was confidently affirmed that the disorder was of the most virulent description, and its attack more general and destructive than in any previous season, except the fatal year 1846. That these reports were highly exaggerated we have no doubt; but that the disease prevails more extensively than for some seasons past, there is reason to believe both on this side of the Channel and in Ireland. At present new potatoes are being forced into consumption at very low prices, which is indicative of fear as to their keeping properties. This naturally tends to decrease the consumption of bread, but it is likely to tell the other way hereafter. The probability is, that supplies of potatoes will suddenly drop off, and we shall then have an increased demand for wheat and Indian corn.

Barley has suffered greatly in colour by the rain which has fallen during the month, and is, like wheat, sprouted in many districts. Oats have been injured by the same cause, but not, we believe, to the same extent. Beans and peas were never regarded as large crops, and neither quantity nor quality has been improved by the weather we have experienced since our last. The rise in wheat has, as usual, had more or less influence on the value of all other articles, and the tendency of prices has been upwards in all parts of the kingdom, till within the last week. The improved weather which we have had since the 20th instant has checked the advance, without, however, causing any material reaction.

We shall probably be in a position to give something like an estimate in our next monthly article. Meanwhile we can only hope that no further disasters will occur, and that the more favourable yield in the north may in some degree compensate for the unquestionable deficiency in the south.

It is impossible to arrive with any degree of accuracy at the quantity of old wheat remaining in farmers' hands, but the general impression is, that the stacks are not heavy. Those of foreign wheat are certainly light, as there has been no temptation at any period of the summer to store; and the greater part of what has been received from abroad at the various ports has been forced off from on board ship at whatever prices were procurable. We do not mean to imply that there is any immediate want of old wheat, but the large granaries are but indifferently filled. And to satisfy a protracted demand for old wheat, such as is likely to be caused by the soft condition of the new, it will be necessary to import on an extensive scale. We do not question that we shall be able to procure all that we are likely to require, but to do this we shall have to pay advanced rates to the foreign grower. We have no bonded stocks to fall back upon, as would have been the case under the old system. When free trade was first introduced, it was generally supposed that it would make England the depôt for grain, and that our warehouses would be always full; its practical working has, however, proved that the foreign merchants know their own interests better than to pay the high charges naturally attending the landing of grain in England.

In sudden cases of emergency, such as this country appears to be at present threatened with, it might therefore become a somewhat difficult matter to obtain prompt supplies, as holders on the other side would raise their pretensions in proportion to the urgency of our wants.

Business at Mark Lane has been more animated this month than at any previous period for a long time past, and the upward movement in prices has been as decided in London as at any market in the kingdom.

The fact is there has not been the same cause for excitement in the north, the weather having been far more auspicious there than in the western and southern parts of England.

The arrivals of wheat coastwise into the port of London have been small, having averaged very little over 3,500 quarters weekly. The quantity brought forward by land-carriage samples from the neighbouring counties has also been unimportant. A considerable falling off has taken place in the receipts per rail from the east coast. The first Monday in the month passed off quietly enough, prices remaining about the same as before; but during the succeeding week the reports of blight and mildew began to increase, and the weather at the same time having become unsettled, an advance of 2s. per qr. was established on the 9th instant. A few lots of new wheat were on that day exhibited, which, though secured early and before the fine weather had broken up, were by no means of a satisfactory quality. One lot was shown so badly blighted and thin of berry as to weigh only 56 to 58 lbs. per bushel. There were, however, a few samples of Talavera tolerably good, for which high prices were paid. The Monday following, the reports of injury to the out-standing crop being confirmed, the old wheat brought forward from Essex and Kent was placed without difficulty at a further advance of 3s. per qr. There was not much new exhibited, and comparatively high rates were consequently realized for the finer sorts, 52s. having on that occasion been paid for superior

white. The improvement in the weather checked the upward movement on the 23rd. This may be considered the first day on which any supply of new wheat of consequence appeared: from Essex there were upwards of 1,000 qrs., and from Kent several hundred quarters; a fair opportunity was, therefore, afforded of judging of the quality. Some idea may be formed of the great variety presented by the samples when we say that there were many parcels not worth more than 40s., and some as low as 34s. to 36s., whilst the best white realized 50s. to 52s. per qr. Nearly the whole of the wheat carried since the rains which began early in the month must have been secured in very bad order, indeed this is proved by the wretchedly soft condition of many of the samples; and some were badly sprouted, totally unfit for miller's use. Old wheat was, in consequence of the inferiority of the new, held very firmly, and could not be purchased cheaper than on that day se'nnight. Considering this the real opening day for new wheat, we give the quotations for red as ranging from 34s. to 40s., and those for white from 40s. to 50s. per qr., extra fine samples of either 1s. to 2s. per qr. more.

In consequence of the prevalence of south-westerly wind during the first fortnight in August, the arrivals of wheat from abroad into the port of London were very small; but during the week ending 21st instant we had a large arrival, and the receipts have since been to a fair extent. Holders of granaried stocks have been encouraged by the general position of affairs to raise their pretensions materially, and the advance on foreign wheat has been quite equal to that established on English. A large business has on the whole been done, as, in addition to a good local demand, buyers have visited Mark Lane from different parts of the kingdom, principally, however, from down-Channel ports. Some quantity has also been taken on speculation. The total advance has amounted to at least 5s., indeed on some descriptions fully 6s. per qr. Within the last week buyers have manifested an unwillingness to continue their purchases at the enhanced rates demanded; but sellers have remained very confident. Red Baltic wheat, such as was obtainable at 38s. to 40s. at the close of July, has lately sold at 43s. to 46s., and the finer kinds at 47s. to 48s. per qr.; for Danzig as much as 54s., and we believe in one or two cases 56s. per qr. has been paid. The arrivals of wheat from the Mediterranean and Black Sea have not been very large; and an active inquiry having been experienced for floating cargoes, partly on speculation and partly on Irish account, an advance on the rates current at the close of last month of 4s. to 5s. per qr. has been established. Polish Odessa, which was then worth 34s. to 35s., has lately commanded 38s. to 38s. 6d. per qr. cost and freight; and for other sorts corresponding terms have been realized. A considerable number of vessels laden with wheat and Indian corn bound to British ports passed Constantinople in the early part of the month, some of which may now be close at hand; but by the latest accounts from Odessa, Galatz, and Ibraila, there was not much grain in progress of shipment, vessels having become scarce.

The continued rise in the value of wheat caused the millers to put up the top price of town-made flour to 43s. per sack on the 16th instant; previous to this, fresh country-made flour had risen 2s. per sack; and in America a large business has been done during the month at gradually improving rates. At the end of July fair brands of United States flour were procurable at 20s. to 21s.; such have since sold at 22s. to 23s., and anything of really fine quality is at present held at 24s. barrel. The arrivals from the other side of the Atlantic have not been large into London; but at Liverpool heavy supplies have been received, hence prices have not risen in that market to quite the same extent as with us. From France comparatively little flour has reached us; most that has come to hand has been from Marseilles, and this description has risen 2s. to 3s. per sack in value.

Supplies of old barley of home growth have for some time past ceased; but we have this month had some quantity of the new crop. The opening price for malting qualities was, on the 9th instant, 28s. to 30s. for good runs, and 30s. to 32s. per qr. for the best sorts. The quality was not by any means fine, the berry being in most cases small and the colour dark. On the 16th there was a somewhat increased quantity of barley from Kent; but the quality being better than the week before, the whole was placed without difficulty at an advance of about 1s. per qr., picked lots bringing 33s., and in some cases even 34s. per qr. These terms have not since been exceeded; but there has, on the other hand, been no reaction, and the present impression is that the really fine malting barley will, in consequence of its scarcity, realize full terms throughout the season. In the early part of the month foreign barley for grinding was rather pressingly offered for sale, and fair qualities were sold at 22s. to 23s., whilst some Egyptian was sold as low as 18s. per qr. Since then the demand has improved, and prices have crept up quite 1s. per qr. Old malt has been in good request, and its value has advanced 2s. to 3s. per qr. This rise has been caused by the belief that but little of the new barley will be suitable for making fine malt, and the old will therefore command a relatively high value.

The arrivals of oats coastwise and from Ireland have been small throughout the month, but having had good receipts from abroad (principally Archangel) no scarcity of this grain has been experienced. On the first appearance of the Archangel supplies prices gave way 1s. per qr., and some were sold as low as 16s. 6d. to 17s. per qr.; since then, however, the value has again risen to 17s. 6d. and 18s. per qr., and most of the arrival has been cleared off the market. The fluctuation in the value of other qualities of oats has been about the same; there was a fall in the early part of the month, which was subsequently recovered, and quotations are now rather higher than they were at the close of July. Old oats are likely to be required for several months; and as stocks of old are nearly exhausted, the foreign in warehouse are likely to bring higher prices hereafter than are at present obtainable. This at all events appears to be the general opinion, and holders have shown no particular anxiety to realize, though the demand has within the last week or ten days again slackened.

Beans of home growth have come somewhat sparingly to hand; but the supply has proved sufficient to satisfy the enquiry, and prices have undergone little or no change. Egyptian beans on the spot have met with a steady demand at about former terms, and for cargoes on passage 24s. to 25s. per qr., cost, freight, and insurance, has been asked.

The transactions in peas have been on quite a retail scale; old have met with very little attention and prices have rather tended downwards. Of new very few samples have been brought forward, and the best white boilers have not been sold below 34s. to 35s. per qr.

In the early part of the month there was a very lively demand for Indian corn afloat, and prices advanced 1s. to 2s. per qr. The reports from Ireland respecting the state of the potato crop having since then become more favourable, the enquiry has in a great measure slackened, and the extreme terms at one time paid are no longer obtainable.

In taking our usual notice of the position of the grain trade at the different foreign markets, we may as well commence by stating that the weather has been very similar this summer over nearly the whole of northern Europe. The spring and early summer were cold and dry, June very wet, and July scorchingly hot.

We do not hear, however, of the prevalence of blight on the continent, and the crops altogether will, we think, turn out much better in Germany, Poland, and Russia, than in this country.

Prices took a sudden start at most of the Baltic markets when it became known there our harvest was likely to prove indifferent; but fewer orders arriving out for the purchase of wheat than had been calculated on, a reaction of about 2s. per qr. took place about the middle of the month; this was, however, recovered on the receipt of the news from Mark Lane of a further rise of 3s. per qr. having been established on the 16th instant, and the latest advices from Danzig state that holders were looking for still higher prices. For good high-mixed Bug wheat, the growth of 1851, weighing 61lbs. per bushel, 45s., for ditto grown in 1850, and weighing 62lbs., 46s. 6d., for Lower Polish high mixed 62lb. 44s., and for inferior 60 to 61lbs. quality 41s. 6d. to 42s. 6d. per qr. free on board had been paid.

At the Lower Baltic Ports, fair to good qualities of red wheat were obtainable, when we last addressed our readers, at 34s. to 36s. per qr. free on board; from this point prices rose to 38s. to 40s., and after undergoing a temporary decline of 1s. to 2s. per qr., again rose. The latest advices from Stettin quote 61 to 62lbs. Pomeranian and Uckermark 39s. to 40s. per qr. free on board, and at Rostock, on the 24th inst., fine heavy parcels could scarcely be secured at 40s. per qr. The reports respecting the probable yield of the wheat crop in that quarter vary considerably. The extreme heat experienced in July is said to have caused premature ripeness, and many of the samples of the new brought forward had, we are informed, a proportion of their shrivelled berries. Still the complaints are not so general as to lead to the belief that the crops have suffered to anything like the extent they have with us, and we are decidedly of opinion that there will be a large surplus of wheat for shipment in the countries bordering on the Baltic.

At the near continental ports prices have been more immediately influenced by the fluctuations in the English markets. At Hamburg wheat rose in value 4s. to 5s. per qr. the first fortnight in August; but the weather having become very fine, the disposition to purchase slackened about the 17th inst., and for some days the trade was very quiet. The advance noticed was, however, maintained, and subsequently prices again tended upwards.

In Holland and Belgium the rye crops are reported to be short, and the wheat harvest only moderate. At Amsterdam a good deal of speculation appears to have taken place, and on the 16th prices jumped up 5s. to 6s. per qr.

The reports from France respecting the result of the harvest are not by any means favourable, and prices of wheat and flour are rapidly rising, as well at Paris as at the markets in the interior and on the coast.

The advices from Odessa, Galatz, &c., speak highly of the crops in Southern Russia, up to a very recent period; and though the latest advices are of a

less confident tone, we believe that a large yield of wheat may be calculated on in that quarter. A good many orders had been received by electric telegraph, to purchase wheat on account of the Greek houses in London, which had caused considerable excitement and a rise in prices. The Indian corn crop is described as rather deficient.

We have accounts of recent dates from the United States, which confirm all that had been previously said respecting the abundance of the harvest in America. Old stocks appear to have held out very well, and the supplies brought forward at the principal markets having been more than sufficient to satisfy the demand, prices of flour and wheat had tended downwards. The shipments in progress for Great Britain were not very extensive, but there can be no doubt that America will be in a position to furnish ample supplies of bread stuffs.

CURRENT PER IMPERIAL MEASURE.

	Shillings per Quarter.					
Wheat, Essex and Kent, white	43	to	47	fine	up to	54
Ditto ditto old	43		47	„		54
Ditto ditto red, new	35		40	„		43
Ditto ditto old	40		45	„		50
Norfolk, Lincoln, & Yorksh., red	42		44	„		45
Ditto ditto old, none				„		46
Ditto ditto white new, none				„		—
Ditto ditto old none				„		—
Barley, malting, new			29			31
Chevalier			32			33
Distilling			27			29
Grinding			26			28
Malt, Essex, Norfolk, and Suffolk, new	50		53	extra		56
Ditto ditto old	46		49	„		52
Kingston, Ware, and town made, new	57		58	„		59
Ditto ditto old	50		54	„		56
Oats, English feed			16		18	fine 20
Ditto Potato			19		21	extra 23
Scotch feed			20		22	fine 24
Ditto Potato			22		24	fine 25
Irish feed, white			16		18	fine 20
Ditto, black			15		17	fine 18
Rye			27		29	old 27 29
Beans, Mazagan			29		30	„ 30 . 31
Ticks			30		31	„ 31 32
Harrow			30		32	„ 31 33
Pigeon			33		34	„ 35 36
Peas, white boilers			33		35	„ 33 35
Maple			31		33	„ 31 33
Grey			29		31	„ 31 33
Flour, town made, per sack of 280 lbs.	—		—		„	38 43
Town and Country Households	—		—		„	36 38
Norfolk and Suffolk, ex-ship	—		—		„	30 32

FOREIGN GRAIN.

Wheat, Dantzic, mixed	44	to	45	high mixed	47	49	extra	55
Konigsberg	43		45	„	46	47	„	49
Rostock, new	43		44	fine old	45	47	„	49
Pomera., Meckbg., and Uckermk., red					41	42	extra	44 47
Silesian				„	41	42	white	44 46
Danish and Holstein				„	40	42	„	42 44
Rhine and Belgium				„	40	43	old	43 45
French				„	40	42	white	41 45
Odessa, St. Petersburg and Riga					35	37	fine	39 41
Barley, grinding						23		25
Distilling						25		27
Malting						none		— —
Oats, Dutch, brew, and Polands						18		20
Feed						16		17
Danish and Swedish feed						17		19
Stralsund						18		20
Russian						17		18

	Shillings per Quarter.			
Beans, Friesland and Holstein	26	29	Konigsberg	31 32
Peas, feeding	28	30	fine boilers	32 34
Indian Corn, white	27	29	yellow	27 30
Flour, French, per sack	28	32	fine	33 35
American, sour per barrel	19	20	sweet	21 24

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
July 17, 1852..	41	0	27	0	19	11	30	1	34	5	30	11
July 24, 1852..	40	7	28	2	19	9	28	9	33	10	34	5
July 31, 1852..	40	0	27	8	20	6	29	11	34	2	33	5
Aug. 7, 1852..	39	7	27	3	20	0	29	7	33	9	30	6
Aug. 14, 1852..	39	7	27	5	19	6	30	3	33	7	31	4
Aug. 21, 1852..	41	2	27	4	19	3	29	4	33	2	29	10
Aggregate average of last six weeks	40	4	27	6	19	10	29	7	33	10	31	9
Comparative avge. same time last year	41	9	26	0	21	10	27	2	31	4	27	9
Duties	1	0	1	0	1	0	1	0	1	0	1	0

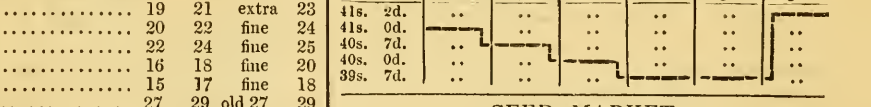
LONDON AVERAGES.

	£	s.	d.		£	s.	d.
Wheat ..	4,870 qrs. 2	5	7	Rye	39 qrs. 1	9	10
Barley ..	50	1	3 11	Beans....	273	1 10	6
Oats	2,036	0 17	5	Peas	34	1 14	4

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette*.	Qrs.	Av. s.	d.	Averages from the corresponding *Gazette* in 1851.	Qrs.	Av. s.	d.
Wheat....	92,576 ..	41	2	Wheat....	64,788 ..	39	10
Barley....	1,762 ..	27	4	Barley....	1,577 ..	26	8
Oats	8,215 ..	19	3	Oats	7,352 ..	20	11
Rye.....	91 ..	29	4	Rye.....	76 ..	27	1
Beans....	2,017 ..	33	2	Beans....	1,970 ..	31	2
Peas	551 ..	29	10	Peas	1,171 ..	25	11

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT during the six weeks ending August 21, 1852.



SEED MARKET.

Friday, August 27.

We have a fair demand for Calcutta and Bombay Linseed, at from 45s. to 46s. 6d. per qr. The imports, this week, have been very moderate. Cakes support previous rates. In other articles we have very few transactions to notice.

BRITISH SEEDS.

Linseed (per qr.).. sowing 50s. to 55s.; crushing 45s. to 48s.
Linseed Cakes (per ton) ..... £8 0s. to £8 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £23
Ditto Cake (per ton) ..... £4 5s. to £4 10s.
Cloverseed (per cwt.)..... red 40s. to 44s., fine 48s. to 50s.
Mustard (per bushel) .... white 5s. to 7s.; brown, 7s. to 9s.
Coriander (per cwt.)..... old 10s. to 12s.
Canary (per cwt.) ..... 38s. to 40s.
Tares, Winter, 28s. to 30s. p. qr.; Spring, 3s. 6d. to 4s. p. bush.
Carraway (per cwt.)..... new 38s. to 40s.; fine 43s.
Turnip, white (per bush.)..... Swede (nominal).

FOREIGN SEEDS, &c.

Clover, red (duty 5s. per cwt.) 38s. to 44s. per cwt., super. 48s.
Ditto, white (duty 5s. per cwt.) ..... 38s. to 46s. per cwt.
Linseed (per qr.).... Baltic, 43s. to 46s.; Odessa, 44s. to 47s.
Linseed Cake (per ton) ..... £7 to £9 10s. 0s.
Rape Cake (per ton)..... £4 5s. to £4 10s.
Hempseed, small, (per qr.) 38s. to 42s., Do. Dutch, 44s. to 46s.
Tares (per qr.) ..... small 28s. to 30s., large 30s. to 32s.
Rye Grass (per qr.) ..... 28s. to 35s.

BOROUGH HOP MARKET.

FRIDAY, August 27.

Samples of new Hops have come to hand from Kent, in full average condition. A pocket from the plantation of Mr. W. Herham, East Peckham, has been sold to Messrs. Kitchen and Ashworth, of Leeds, at £8 8s. per cwt. The present value is £8 to £8 5s. for fine. Yearling and old Hops are very dull at nominal quotations. The plantation accounts are very favourable, and the duty is called £210,000 to £220,000.

POTATO MARKETS.

BOROUGH AND SPITALFIELDS, Friday, Aug. 27.

The arrival of Potatoes by land-carriage are very large, and in improved condition; many of the samples being of greatly increased weight. A steady business is doing, at late rates—viz., 60s. to 125s. per ton.

PROVISION MARKET.

FRIDAY, Aug. 27.

We have to report a very dull inquiry for all kinds of Irish Butter—the stock of which is on the increase—at a decline in price of from 1s. to 2s. per cwt. Foreign parcels move off slowly, yet fine Friesland is worth 78s. to 80s. per cwt.

English Butter is rather lower to purchase. Fine weekly Dorset, 80s. to 86s.; inferior, 66s. to 75s. Devon, 60s. to 70s. per cwt.; fresh, 8s. to 10s. per dozen lbs.

The Bacon market is heavy at 1s. to 2s. per cwt. less money. Hambro', 54s. to 58s. Hams and middles have a downward tendency.

Fine Lard is quite as dear, but other kinds are cheaper. Irish bladdered, 60s. to 66s.; kegs, 58s. to 59s.; Hambro' bladdered, 63s. to 65s.; kegs, 55s. to 58s. per cwt. Beef and Pork very dull.

ENGLISH BUTTER MARKET.

MONDAY, Aug. 23.

We again note a dull trade. Prices of our best quality are maintained only with difficulty, while all middling and inferior goods are unsaleable.

Dorset fine weekly.....84*s.* to 86*s. per cwt.*
Devon .....76*s.* to 80*s.* „
Fresh.....8*s.* to 10*s. per doz.*

BELFAST, (Friday last.)—Butter: Shipping price, 72s. to 78s. per cwt.; firkins and crocks, 8d. per lb. Bacon, 50s. 56s; Hams, prime, 66s. to 70s.; second quality, 54s. to 56s. per cwt.; mess Pork, 90s. per brl. Irish Lard, in bladders, 56s. to 60s.; kegs or firkins, 56s. to 58s. per cwt.

	Butter.		*Bacon.*		*Dried Hams,*		*Mess Pork.*	
Aug.	*per cwt.*		*per cwt.*		*per cwt.*		*per brl.*	
19.	*s. d.* *s. d.*		*s. d.* *s. d.*		*s. d.* *s. d.*		*s. d.* *s. d.*	
1848	72 0	80 0	60 0	64 0	66 0	82 0	80 0	82 0
1849	60 0	66 0	48 0	50 0	68 0	75 0	76 0	78 0
1850	64 0	70 0	37 0	42 0	65 0	70 0	60 0	62 0
1851	65 0	73 0	45 0	47 0	62 0	66 0	64 0	66 0
1852	72 0	78 0	50 0	56 0	66 0	70 0	85 0	90 0

PRICES OF BUTTER, CHEESE, HAMS, &c.

	s.	*s.*		*s.*	*s.*
Butter, per cwt.					
Friesland.....	80	*to* 82	*Cheese, per cwt. Cheshire*	50	*to* 70
Kiel	—	—	*Cheddar*.....	56	68
Dorset.....*new*	88	99	*Double Gloucester.*	46	56
Carlow..... „	71	76	*Single do.* ..	42	48
Waterford.... „	—	74	*Hams, York*	60	70
Cork..... „	—	72	*Westmoreland*....	60	66
Limerick..... „	—	68	*Irish*	56	62
Sligo..... „	—	70	*Bacon, Wiltshire, green*	62	64
Fresh, per doz....	9	12	*Waterford*	60	62

CHICORY.

Per ton.

	£ *s.*	£ *s.*		£ *s.*	£ *s.*
Foreign root (d.p.)			*English root (free)*		
Harlingen 27	0	28 0	*York*.....	8 10	9 10
English root (free)			*Roasted & ground*		
Guernsey 10	0	10 10	*English*.....30	0	40 0
Kent and Suffolk.	*none.*		*Foreign*.....40	0	50 0

Duty on all Coffee and roasted Chicory imported, 3d. per lb.; on Chicory Root £21 per ton.

TALLOW MARKET.

FRIDAY, August 27.

Although the supply of Tallow on passage from St. Petersburg is comparatively small, the demand here is inactive. To-day, old P.Y.C. on the spot has sold at 39s. to 39s. 3d.; and new, 39s. 6d. to 40s. per cwt. Town Tallow, 37s. 6d. to 38s. per cwt. net cash; rough fat, 2s. 1½d. per 8lbs. This week's imports are 484 casks from Port Philip, 25 from Calcutta, and 91 from Sydney. The Russians still hold 25,000 casks.

HAY MARKETS.

THURSDAY, August 26.

The general demand is in a very inactive state, and in some instances prices have a downward tendency; the supplies are seasonably extensive.

	At per load of 36 trusses.			
	Smithfield.	Cumberland.	Whitechapel.	
Meadow Hay, old	70s. to 84s.	75s. to 86s.	70s. to 83s.	
Do., new	55s. 74s.	60s. 75s.	65s. 72s.	
Clover Hay, old	70s. 100s.	80s. 100s.	75s. 105s.	
Do., new	70s. 81s.	60s. 80s.	70s. 84s.	
Straw.....	27s. 31s.	29s. 33s.	26s. 31s.	

WOOL MARKETS.

FRIDAY, August 27.

The imports this week are 673 bales from Port Philip, 139 from Mogador, 874 from Algoa Bay, 990 from Sydney and 20 from Hambro'. The sale for all kinds is heavy, and to effect sales lower prices must be submitted to. The stocks are rapidly increasing.

HIDE AND SKIN MARKETS.

	s.	*d.*	*s.*	*d.*	
Market Hides, 56 to 64 lbs.....	0	1¾	*to* 0	2	*per lb.*
Do. 64 72 *lbs*.....	0	2	0	2¼	„
Do. 72 80 *lbs*.....	0	2¼	0	2½	„
Do. 80 88 *lbs*.....	0	2½	0	2¾	„
Do. 88 96 *lbs*.....	0	2¾	0	3	„
Do. 96 104 *lbs*.....	0	3¼	0	3½	„
Shearlings.....	1	4	1	7	*each.*
Lamb Skins.....	1	8	2	10	„
Horse Hides.....	5	0	0	0	„
Calf Skins, light	1	6	2	6	„
Do. full	3	6	4	6	„

TIMBER.

	(Duty paid.)	£	*s.*	*d.*		£	*s.*	*d.*
Baltic Timber, per load of 50 cubic feet		2	10	0	*to*	3	5	0
Yellow Deals per standard 100....		11	0	0	..	15	10	0
Deck Deals, per 40 feet 3 in.		0	14	0	..	1	2	0
Pipe Staves, per mille		110	0	0	..	142	10	0
Lathwood, per fathom of 6 feet		6	10	0	..	8	0	0
Petersburg, Riga, and Archangel.....	*Yw. Deals, per stand. hundred*..	13	0	0	..	15	10	0
	White	10	0	0	..	11	0	0
	Yellow Battens	13	0	0	..	15	10	0
Riga Logs, for 18 feet cube		2	0	0	..	4	10	0
Stettin Staves, per mille of pipe.....		80	0	0	..	155	0	0
Swedish Timber, per load		2	7	6	..	2	12	6
Gothen. Yw. Deals per hun. 12 ft. 3 in. 9 in.		15	10	0	..	20	0	0
	White ditto	15	0	0	..	17	0	0
	Yw. Battens, per hd. 12 ft. 2½ in. 7 in.	10	0	0	..	13	0	0
Christiana Yw. Deals per hd. 12 ft. 3 in. 9 in.		17	0	0	..	22	0	0
	White ditto ..	15	10	0	..	19	0	0
Quebec and St. John's Spruce Deals,	*per hundred, 12 ft. 3 in. 9 in.* ..	14	10	0	..	17	10	0
	1st quality yw. Pine Deals, per st. hd.	13	0	0	..	16	0	0
	Second do. do. ..	11	0	0	..	12	0	0
	Third do. do. ..	9	10	0	..	10	0	0
	Red Pine Deals per hd. 12 ft. 3 in. 9 in.	15	0	0	..	20	0	0
Red Pine Timber, per load		3	0	0	..	3	10	0
Yellow ditto		3	10	0	..	4	0	0
Birch ditto		2	5	0	..	3	10	0
Elm ditto		2	10	0	..	4	10	0
Oak ditto		4	0	0	..	4	10	0
Standard Staves, per mille Standard....		65	0	0	..	75	0	0
Puncheon Staves, per mille		14	0	0	..	18	0	0

BARK.

Per load of 45 cwt.

	£	*s.*	*d.*	*to*	£	*s.*	*d.*
English Tree.....	£11	0	0	*to*	£14	0	0
Coppice	13	0	0		15	0	0
Mimosa.....*per ton*	9	0	0		10	0	0
Valonia..... „	14	0	0		16	0	0

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A Hereford Steer

The Property of Edward [illegible] Esq.r of Alperton near Sudbury [illegible]

Medal awarded at the Smithfield [illegible]

A South Down Ram

the property of William Ellman Esq.r of Glynde near Brighton, in which the First Prize of Five Guineas and a Silver Cup of Fifty Pounds Value was awarded at the Meeting of the Smithfield Club in December 1824.

THE FARMER'S MAGAZINE.

OCTOBER, 1852.

PLATE I.

A HEREFORD STEER,

The property of Edward Longmore, Esq., of Alforton, near Ludlow, to which the first prize of Thirty Sovereigns and the Silver Medal were awarded at the Smithfield Club Cattle Show, in December, 1851.

PLATE II.

A SOUTH-DOWN RAM,

The property of William Rigden, Esq., of Hove, near Brighton, to which the first prize of Thirty Sovereigns was awarded at the Royal Agricultural Society's Show at Windsor, in July, 1851.

JETHRO TULL.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

Some years have now elapsed since I endeavoured, in two essays, to draw the farmer's attention to the merits of some of Jethro Tull's efforts (*Quar. Journal of Agriculture* 1841, *page* 342—*Bell's Messenger*), especially to his work on the horse-hoe husbandry. I am agreeably reminded of the sketches I then offered, by two recent lectures of Professor Way upon the same subject, in which when describing his own valuable chemical researches upon the properties of soils, he gives to Tull the merits of having long since advocated principles which the Professor's late discoveries tend so materially to illustrate. The main principle on which Tull argued was this—that the soil and the atmosphere together contain all that is necessary, without the aid of any manures, for the production of a luxuriant vegetation, but that to render the one or the other available for this purpose it is necessary that the soil should be rendered readily permeable by the air, by being well pulverized.

How Tull arrived at these sagacious conclusions we cannot determine: he knew nothing of the existence of carbonic acid gas in the atmosphere, which so materially aids in the support of vegetation; the age in which he lived was equally ignorant of the existence in minute proportions of ammonia in the air. Tull therefore must have arrived at his conclusions by practical observations and a chain of reasoning, which in connection with the knowledge of the age we cannot always readily follow. The discoveries of Mr. Way were briefly alluded to by him a few days since, when addressiug the council of the Agricultural Society of England, on the illustration they offered to the labour and conclusions of Tull. His own recent investigations, he observed, had brought to light the existence in the soil of certain double silicates, possessing the power of abstracting the carbonate of ammonia from the air with as much avidity as if they were strong acids. A good soil, well opened by cultivation, would therefore be constantly at work, day and night, collecting ammonia from the air; and

the quantity that could be so obtained would only be limited by the frequency of the renewal of the air. Of course we could not say how often this would take place; but what with alternations of temperature, differences in the heat of the soil and the air, the influences of wind, and perhaps also a constant interchange in the particles of air themselves, it was evident that the renewal of the air in the soil, and the constant acquisition by it of ammonia, might go on to a very great extent. And it was worthy of remark, too, that this collection of ammonia by the soil was quite independent of rain and dews, and was always proceeding. The more, therefore, the soil was exposed to the air the richer it would become. Of course he spoke of soils containing a sufficient quantity of clay. Some light soils there might be, that would be injured, not benefited, by such exposure. The experiments of the Rev. Mr. Smith, at Lois Weedon, are on soils of the former description: his crops of wheat, which were now growing on land which had been for six years under wheat without manure of any kind, looked as if they had received a dressing of ammoniacal salts; and that indeed was the fact, though the ammonia had been added not *directly*, but *indirectly, and from the air*, by the abundant cultivation which Mr. Smith's method enabled him to give. So far then as the organic elements of vegetation are concerned, there is no absolute impossibility, but, on the other hand, every probability, that they might be secured in all abundance for large crops without manure, provided that the soil be fully exposed to the influence of the air.

It is refreshing to see the steady, although tardy, arrival at truths like these. Such scientific illustrations of disputed facts are valuable and cheering in more ways than one: for, as I have before had occasion to remark, it would tend to the advancement of improvement, and materially aid the inventors of agricultural machines and other agents, if the agriculturist occasionally remembered the difficulties under which all persons labour, who, quitting the beaten track, propose innovations upon old systems. It is now but a very few years since the proposed use of guano and of superphosphate of lime as fertilizers was received with the same degree of ridicule by the thoughtless and indolent, as that with which, a century since, the farmers of Jethro Tull's time assailed the great author of the drill husbandry. An amusing instance of this was produced by Mr. Hannam, at a meeting of the Wetherby Farmers' Club, in which so late as the year 1846, a zealous correspondent of an agricultural paper decried the use of the superphosphate of lime as only fit to be classed with the visions of Joanna Southcote, the South Sea bubble, and the Cæsarian cow-cabbage. It was such a spirit of opposition that Jethro Tull had to encounter. His plans for the improvement of agriculture, met, as a matter of course, with the ardent opposition of all those who were believers in the already attained perfection of agriculture. These were well supported by the amazingly solemn arguments of the great class who rely solely upon practice, and despise reasoned knowledge; and both these descriptions of persons were aided by the easy ridicule of those who adopted the more pleasant and very easy mode of exciting a laugh or producing a sneer at what the circle around them perhaps did not even remotely comprehend. All these things, more than a century since, Jethro Tull encountered, obstacles which he energetically and feelingly describes in his "Horse-hoe Husbandry." The "Life and Works of Jethro Tull" will indeed well repay the careful study of the young farmer. It will afford not only instruction, but encouragement to him who has to contend against the poorest soils — the most adverse circumstances. If such a cultivator holds a poor thin hungry soil, so did Jethro Tull. If he farms in a remote and desolate district—if he has ignorant and obstinate labourers—if he is visited by sickness — even if he is almost driven from his profession by incurable diseases—so, let him be assured, was that great farmer whose labours are the subject of this paper. He was born in Oxfordshire, on his paternal estate. Being educated for the legal profession, he became a member of Staple Inn, and was called to the bar on the 11th of December, 1693, by the benchers of Gray's-inn. Soon after he was afflicted with a pulmonary disorder, and in consequence, abandoning his Oxfordshire farm, he travelled for some time on the Continent. He was, it appears, for a considerable period at Montpelier, in the south of France. Returning to England, he took into his own hands the farm called Prosperous, in the rural parish of Shalborn, in Berkshire; where again returning to those agricultural efforts which he had commenced in Oxfordshire, he wrote his "Horse-Hoe Husbandry."

After Tull's decease, his lands in Berkshire found their way into chancery, and were sold by order of the court in 1784, to Mr. Blandy, the father of the present owner. It consists of about 70 acres of freehold land; but Tull held about 130 acres in addition, by a different tenure. The house in which he dwelt has been modernized, but

the old-fashioned brew-house yet remains as Tull had it, and when we visited Prosperous in July 1840, was still in very good condition. Of the out-houses, Tull's granary and his stables are yet in existence, though fast verging to destruction; and at the end of this granary, which Tull built, is an old well, in which, when cleared out some years since, was found, deeply buried in the accumulated mud of nearly a century, a three-pronged hoe, which there is no doubt belonged to Tull, and is now in the museum of the Royal Agricultural Society of England, to whom it was presented by Mr. Alderman, of Kintbury and myself. Into this well it was most likely thrown by his men, who, adopting the use of his new tools with the utmost reluctance, annoyed him in many ways. Against those he declaims with much bitterness. "'Tis," he says, "the most formidable objection against our agriculture, that the defection of servants and labourers is such, that few gentlemen can keep their lands in their own hands, but rather than make nothing of them, they let them for a little to tenants who can bear to be insulted, assaulted, kicked, cuffed, and bridewelled with more patience than gentlemen are endowed with." This burst of feeling would very clearly intimate the probable truth of the case—that Tull was energetic and irritable—that his servants pillaged and annoyed him—and that he did not submit to their impositions without struggling against them in a way which his legal education should have taught him to avoid.

Such was the spirit of enterprise, and such was the genius of Tull, that no difficulties, however formidable, stopped him in his researches. His experiments, carried on in his garden and in his house, with regard to the food and the habits of plants, some of which he gives in the first pages of his work, betrays the thirst for knowledge, the industry and tact, which he possessed.

The tradition of his neighbourhood is, that when confined to his room and to his couch by his incurable maladies, he yet managed to carry on his experiments on vegetation, by having large boxes and garden-pots of earth placed in his room, and before his windows, where he sowed his seeds, and watched their progress under different modes of cultivation, with all the zeal of a martyr, and the enthusiasm of an inventor. He is still spoken of by the old labourers of that district as being a man whom it was impossible to oppose in any of his plans with eventual success. He was evidently the wonder of his neighbours, who would, perhaps, have regarded him as a magician, if the age of witchcraft had not then been nearly, if not quite over. The genius of Tull was evidently before the spirit of his age. At the period he wrote, turnips had been but just introduced into England as a field crop; and yet in the preface to his work (published in 1732) he devotes (what is even now sometimes regarded as a novelty) their being drilled amongst corn crops, and alludes to "a particular drill for planting turnips between rows of corn, both in wide and in narrow intervals." The advantage, he continues, is such, that being small at harvest, they do no perceivable damage to the corn, and yet aftetwards grow large by hoeing; and being fed off by sheep in the winter, afford considerable profit, and also enrich the land for a following crop. Those who have recently so ably advocated the employment of reduced amounts of seed, have little suspected that nearly a century and a half since Tull practised and advocated the system. Yet he certainly tells us, at page 50 of his work, "about the year 1701, when I had contrived my drill for planting sainfoin, I made use of it also for wheat, drilling many rows at once, which performed the work much better than hands could do, making the channels a foot distance. Drilling in the seed and covering it did not amount to more than 6d. per acre expence, which was above ten times over paid by the seed that was saved, for *one bushel to the acre was the quantity drilled.*" This was, he adds, turned to a very good account, and in considerable quantities, it has brought as good a crop of wheat on barley stubble as that sown in the common way on summer fallow, and when that sown the old way on the same field on barley stubble entirely failed, "though there was no other difference but the drilling and hoeing." Well might the farmers who lived near to Tull regard him as indeed an innovator. "They use," says Tull (p. 122, edition 1733), "for an acre of wheat sown in the old husbandry in the county where I live, in some places, 2½ bushels of seed; in other places four bushels and a half of seed." Jethro Tull's great improvements in tillage consisted in the use of his drill, and in the adoption of such wide intervals between his rows of turnips (from three to six feet), that the horse-hoe could be easily and constantly employed, and this great advantage he extended to all his cereal crops. To every agricultural operation, too, of a mechanical nature Tull's genius was admirably adapted. His ploughs, his hoes, his drills, were all of a description far superior to the rest of the farmers of his day. It was only where he attempted to reason (in support of his theory that manure was unnecessary) upon the

habits and food of plants, involving chemical truths, that Tull made great blunders. But then in his excuse let us not forget that vegetable chemistry in his days did not exist. If he was deceived in his belief of the powers of the plough to render all soils fertile without the assistance of manure, he was yet fully justified in almost every thing that he predicted with regard to the advantages of thoroughly pulverizing and increasing the depth of the soil.

"The difference betwixt the operation of the spade and that of the plough," he observes, "is only this, that the former commonly divides the soil into smaller pieces, and goes deeper;" and he adds, "how easy and natural it is to contrive a plough that may equal the spade, if not exceed it, by going deeper, and cutting the soil into smaller pieces than the spade commonly does." The explanation, too, which Jethro Tull gave of the advantages or theory of deep ploughing was excellent, considering the chemical knowledge of his days; for the modern cultivator must remember that, in his time, the composition of the atmosphere was almost entirely unknown. Tull could not have known anything of the three gases of which the atmosphere is composed, and of the existence of its insensible aqueous vapour he was equally unacquainted; he did not know how important these are to the roots of plants, and how the access of them all is naturally promoted by pulverising the land on which they vegetate. But though Tull did not know these things, yet it is certain that he had carefully observed many facts which proved that vapour was absorbed by the soil, and that this absorption was promoted by pulverisation. "To demonstrate," he says (pp. 27, 28), "that dews moisten the land when fine, dig a hole in the hard dry ground, in the driest weather, as deep as the plough ought to reach; beat the earth very fine, and fill the hole therewith; and after a few nights' dews, you will find this fine earth become moist at the bottom, and the hard ground all round will become dry. Till a field in lands; make one land very fine by frequent deep ploughing, and let another be rough by insufficient tillage alternately; then plough the whole field crosswise in the driest weather, which has continued long, and you will perceive, by the colour of the earth, that every fine land will be turned up moist, but every rough land will be dry as powder from top to bottom. In the driest weather. good hoeing procures moisture to roots; though the ignorant and incurious fancy it lets in the drought, and therefore are afraid to hoe their plants at such times.

Poor Tull evidently had not much knowledge of the management of stock. His explanation of the causes which led him to refrain from keeping sheep are amusing; he says: "The reasons why I kept no sheep are many—I have no common, nor down, nor pasture, nor meadow to keep them upon, and sainfoin is unfit for store sheep, so that if I kept a fold I should be obliged to till with horses only; which according to the rules whereby our servants are pleased to govern us, would cost me one full rent more than the same tillage done by oxen. I find it very difficult to preserve my corn from being spoiled by neighbouring sheep; but if I had a flock of my own it would be more difficult."

The farm of Jethro Tull will ever be an object of interest to the lover of agriculture. Arthur Young made a pilgrimage to Prosperous (Annals of Agriculture, vol. 23, p. 173); William Cobbett did the same. More persons would visit it, if they knew where it is to be found. To such it will be interesting to know that the rural parish of Shalborn is situated under the Coomb Hills, about four miles south of Hungerford; that the roads are tolerable, and the present holder of the farm obliging, and not insensible of Tull's great merits. Arthur Young says very justly, "The house itself, not the less interesting to me for being so very humble, tiled as part of it is with glazed tiles of Tull's own manufacture, was an object of attention, for I have a very great, though melancholy, pleasure in viewing buildings and spots that have been the residence of those who rendered themselves celebrated by their actions or their writings, and particularly such as were noted for their exertions in husbandry; the farm, however, was my principal object."

Jethro Tull died, according to Chalmers, at Prosperous, on the 16th of January, 1740, the year before Arthur Young was born; but if he died in the parish of Shalborn, he was not buried there—the parish register is silent on that head. The tradition of the old people of the neighbourhood is, that he died and was buried in Italy. To his memory some memorial will surely one day be erected worthy of the English farmer. His deeds, his triumphs, it is true, were of the quiet peaceable kind, with which the world in general is little concerned; but their results, their value to the land of his birth, were of no mean order. His conceptions were solid and comprehensive; and whether we regard his drill, his ardent advocacy of the power of the plough, his reduced amounts of seed, or his other great points of improved husbandry, we see him labouring for the diffusion of truths,

which are even yet, in the majority of instances, not sufficiently regarded. The efforts, too, of Tull were productive of advantages in other and in indirect ways; his researches, his successes, his example, first excited a spirit of agricultural inquiry which since his days has hardly ever entirely slumbered. He was certainly the first who dared boldly to quit the beaten track which had been used by farmers for ages, and follow a way of his own. And although he has been well followed and imitated by succeeding cultivators, who have availed themselves of discoveries and machinery of which Tull had not the assistance, yet there have been none who have since excelled, or perhaps equalled, him in the boldness or originality of his conceptions, or in the energy with which he realised them.

THE SCIENCE OF MANURING.

BY T. ROWLANDSON, C.E., F.G.S.

CHAP. VI.—ON LIME.

Scarcely any subject in connexion with agriculture has been more provocative of discussion than that of the application of lime and calcareous substances generally. Some years ago I published an article on this subject, which attracted pretty general attention at the time, as its general tenor was diametrically opposed to received opinions. Notwithstanding, I have had the pleasure of receiving communications from some of the first agriculturists of England, expressive of their concurrence as to the correctness of my views; still so difficult and slow is the eradication of error and the dissemination of novel truths, that I feel certain the present epitomized form in which it is my intention to condense my views on this subject is second only in importance to that of general manuring. It is not my intention to contend for the actual chemical correctness of many of the matters which will be subsequently stated, seeing that there are, to a certain extent, exceptional circumstances: thus, when peat is treated with quick lime the compound still partially gives a colour to liquid ammonia, but to nothing like the extent to which it will do if not previously mixed with lime. These are refinements which may be safely overlooked, so far as actual farming practice is concerned; and it is only as a practical guide to farmers unacquainted with chemistry, that the paper is written. Had this paper been intended as a purely scientific disquisition, the deficiency noted would have been an unpardonable one. For want of a popular guide to the use of calcareous manures, they are frequently misapplied on soils where they cannot be of service, but often the contrary; whilst, on the other hand, prejudices arising out of seeing their injurious effects on one soil not unfrequently prevent their being laid on others where they would be decidedly beneficial. That there is a wide and curious field for future investigation respecting the point whether the substance termed humus does or does not find its way into plants in a soluble form, by means of its combination with alkalies, is undoubted; also that the clearing up of this debatable point would remove and clear away much that is now uncertain. Whatever may be the eventual result of subsequent investigation, in a purely scientific point of view, with regard to actual practice, I can with the greatest confidence, formed after an extended experience both as regards time and space, safely commend the views I am about to detail to the attention of the working farmer, and for whose use it was solely composed.

THE KINDS OF SOIL TO WHICH LIME IS USUALLY APPLIED.

The most emphatic, and at the same time the most correct answer that can be given on this point is, every known description of soil, from blowing sand to stiff clay, the vicinity to a lime-kiln, and economy of cost, appear to be the only matters which enter into the calculation of the farmer. The facility and cheapness of procuring lime are the principal causes of its extensive use and abuse: it may, however, be stated that on clays, moors, and bogs it is found to be most useful—on sands the least beneficial. The question respecting the use of fresh or well-fermented farmyard manure has not been more productive of opposite opinions than the utility of lime in agriculture. My own experience—and on this subject it has been most extensive—serves to show that lime, when used with judgment, is most valuable; when abused, most injurious.

On clay lands it has been a constant practice to apply lime prior to sowing wheat; and to a certain extent with beneficial results—that is, a better crop of wheat has been obtained after an application of lime than on the adjoining land of similar quality without such application. The cause is as follows: All clays contain a considerable quantity of silicates and salts of potash and soda, in a dormant state: it is one of the properties of lime, especially when exposed to the slow but universally acting

solvent power of carbonic acid, to decompose such dormant materials, and convert them into soluble forms, and thus become susceptible of absorption by the roots of plants. In this way a stiff clay, which has been previously deprived of almost all the available portion of the mineral constituents of plants, again becomes to a certain degree fertile, and capable of producing a profitable crop. Practice agrees with theory on this point, as it is found most beneficial to apply lime on clays in the course of the fallow season, during which the repeated ploughings, &c., cause a more intimate mixture with the soil, and promotes, by the aid of the atmosphere and moisture, a quicker decomposition of the inorganic substances required by plants, consequently followed by subsequent fertility. Stiff soils, containing lime in the state of carbonate, usually called marls, are, however, scarcely benefited by the application of lime: a portion of such marls burned and applied to the land will be more economical and equally beneficial. It will thus be seen that the greater part of the benefit due to the application of lime is attributed to its solvent powers; but this mode, which is that ordinarily used, is not nearly so beneficial as if lime or limestone was burned in combination with stiff clays, lime so burned being one of the most powerful decomposers of minerals that is known. The application of this principle is well understood, and frequently acted upon by chemists, in order to decompose refactory minerals, which are of difficult solution by the ordinary solvents. From their slight degree of porosity, clay soils are apt to retain water more than any other description, with the exception of turf; the latter absorbing and retaining more through the effect of capillary attraction, in consequence of the minutely reticulated state of the soil, caused by the interlacement of the roots of the plants which compose it. The tendency of clays, especially when undrained, to retain water in a partial degree, causes the accumulation of the same acid substances (humid acid) which forms the great bulk of our turf bogs; and hence arises that character of sourness which farmers apply to such soils, the sheep-sorrel (rumex acetosella) always making its appearance more or less whilst under tillage, and sometimes in pasture. An application of lime completely destroys the pernicious effects arising from the presence of humid acid. I will, however, notice this matter more fully, immediately whilst reviewing the effects of lime when applied to bog land. It has long been held that the great benefit derivable from the application of lime arose from the fact, that the lime had the property of converting vegetable matter, whether fresh, decaying, or decayed, from an insoluble to a soluble state, so as to become adapted as food for plants. Whilst engaged in reclaiming some hitherto uncultivated bog, I was led to examine minutely into this matter, when, instead of finding the prevalent dogma on this subject correct, I found the opposite the fact. It is unfortunate that the theory of lime acting as a solvent of the inert vegetable matter in soils received the aid and countenance of the late Sir H. Davy, which, together with the pertinacity of German writers, has given to this theory such a footing that it will be most difficult to eradicate the erroneous impression so long entertained on the point. If lime rendered soluble the insoluble vegetable matter in soils, the question immediately arises, what is the nature of the compounds thus formed through its influence?

So intimately are the substances variously called humic, geic, &c., acids and humus, gœine, apotheme, &c., connected, both according to the former theories and the opinions which will be hereafter set forth, with the action of lime as a fertilizer, that I shall at once take into consideration their mutual connection. In doing so, I shall treat humus, humic acid, &c., as one and the same substance, being satisfied that for all practical purposes it is unnecessary to make any distinction, as I have not been able satisfactorily to distinguish more than one substance in vegetable soils, susceptible of being dissolved in alkalies—ammonia, potash, and soda—and insoluble in combination with magnesia, lime, &c.

In treating of humus as a source of carbon in plants, Liebig, in his "Chemistry as applied to Agriculture and Vegetable Physiology," states that "the common view which has been adopted respecting the *modus operandi* of humic acid has given occasion to the following inexplicable phenomenon:—A very small portion of humic acid dissolved in water gives it a yellow or brown colour; hence it would be supposed that a soil would be more fruitful in proportion as it was capable of giving this colour to water—that is, of yielding it humic acid. But it is very remarkable that plants do not thrive in such a soil, and that all manure must have lost this property before it can exercise a favourable influence upon their vegetation."

"Water from barren peat soils and marshy meadows, upon which few plants flourish, contains much of this humic acid; but all agriculturists and gardeners agree that the most suitable and best manure for plants is that which has completely lost the property of giving colour to water." A peat bog consists of a large amount of vegetable matter; the decayed consists of an extremely deep brown coloured matter, very pulverulent and insoluble in distilled or spring water; the bottom of deep peat

bogs consists almost wholly of humic acid, the whole of which, or nearly so, can be dissolved in ammonia, potash, or soda, and by boiling, or long continued digestion by their carbonates. Ascending from the bottom to the top of a deep bog, the humic acid becomes more and more mixed with vegetable fibre, the latter being slowly converted into humic acid; this conversion of dead plants into humic acid appears intimately connected with the fact of their decay taking place in water. The most striking property of humic acid is, that it is wholly insoluble in spring or distilled water; the former is exemplified by the fact, that a spring issuing through the middle of a deep bog appears on the surface as pellucid as though it had issued from limestone, and is equally tasteless. For upwards of three years I dwelt at a place where all the water used, whether for table or ordinary purposes, was obtained from such a spring, which had further to pass over more than a quarter of a mile of uncultivated morass; the spring arose from the millstone grit, and had all the purity generally attendant on springs arising from that formation, and was perfectly pellucid. It is a remarkable property of humic acid that it is extremely soluble in the alkalies, ammonia, potash, &c., though insoluble in water; equally so is the fact, that it is insoluble in combination with lime, magnesia, iron, alumina, lead, &c. Humic acid can be obtained in a pure state by macerating a piece of dark-coloured peat in either of the alkalies previously mentioned, when the solution will become of an intensely brown colour, so deep as to appear black; if a little acid be now poured on the solution, in sufficient proportion to saturate the alkali, a dark-coloured precipitate will be formed, which may be obtained either by filtration or decantering the super-natant liquor.

Humic acid so obtained is a light floculent matter, and soluble, according to Sprengel, in 2,500 times its own weight of water; but even this sparing solubility is destroyed if the humic acid is exposed to a warm atmosphere until it is perfectly dry. If, however, instead of precipitating the humic acid from an alkaline solution by an acid, we precipitate the same by the use of lime water, a precipitate is formed of a somewhat darker colour than that just alluded to; and, if applied in exact proportions, not a trace of lime will be found in the water. A very easy method of proving this is to procure a wine glass filled two-thirds with lime-water, and place therein a small piece of black peat; if left over night and examined the following day, not a trace of lime will be found in the water; this can be ascertained by testing it with oxalate of potash or ammonia, on pouring in a few drops of which a precipitate of oxalate of lime will immediately appear if lime is present. A further proof, and one still better adapted to illustrate the matter for practical purposes, is to procure a piece of peat, and in the first instance see that it gives a deep-coloured solution to ammonia or potash, take the same piece and intimately mix it with quick lime and water; after this, try whether, when treated with ammonia or potash, will the brown-coloured solution alluded to appear; it will now be found to give only a slight tinge, owing principally to the fact of some of the humic acid not having become intimately mixed with lime. This insolubility of humic acid in the presence of calcareous matters is well illustrated by Liebig, who observes that, "The stalactic caverns of Franconia, and those in the vicinity of Barmth and Strulborg, lie beneath a fertile and arable soil. The abundant decaying vegetables or humus in this soil, being acted on by moisture and air, constantly evolve carbonate acid, which is dissolved by the rain. The rain-water thus impregnated permeates the porous limestone which forms the walls and roofs of the caverns, and dissolves in its passage as much carbonate of lime as corresponds to the quantity of carbonic acid contained in it. Water and the excess of carbonic acid evaporate from this solution when it has reached the interior of the caverns, and the limestone is deposited on the walls and roofs in crystalline crusts of various forms. There are few spots on the earth where so many circumstances favourable to the production of *humate* of *lime* * are combined, if humus † actually existed in the form of humic acid. Decaying vegetable matter, water, and lime in solution, are brought together, but the stalactities formed contain no trace of vegetable matter, and no humic acid. They are of a glittering white, or yellowish colour, and in part transparent like calcareous spar, and may be heated to redness without becoming black." It may be remarked, that although the appearance of coloured water on bogs, and in some instances on undrained poor clays, would appear to countenance the humus theory, yet the contrary is the case. This coloured appearance of water in bogs is attributable to the fact that such water is rain, not spring water, the former always containing a small portion of ammonia, which combines with the humic acid, and thus arises the coloured appearance. An additional cause arises from the fact that newly-formed humic acid is partially soluble in 2,500 times its own weight of water; and, as humic acid is always form-

* That is, soluble humate of lime, according to the principles propounded by former theorists.

† The same remark applies here; that is, humic acid may exist, but no acid with properties similar to those supposed by the humus theory.

ing in such soils during the presence of moisture, this adds a little to the colour.

A few simple experiments, which any farmer may make at his own kitchen fireside in the manner before directed, will prove the above. Only a few wine or tall ale glasses, and a pennyworth or two of hartshorn, will be required for the purpose. As a proof of the intimate combination which takes place between lime and humic acid, it may be stated, when humic acid is precipitated in combination with lime from its solution in alkali, the precipate is not acted on by oxalic acid. It will be found that a fertile soil, whether composed of vegetable matter or not, is insoluble, with the exception of 100,000th part of its weight in water, and the soluble matter consists principally of alkalies; neither is any considerable portion of such soils soluble in alkalies, and lime only assists to free the silicates, &c., as previously noticed, whilst barren mosses, bogs, moors, &c., have equally the property of being insoluble in pure water, combined with a large portion which is soluble in alkalies. This property of being soluble in alkalies is destroyed by the presence of lime or calcareous substances. The test for using lime on soils containing much vegetable matter is, whether such soil give a brown-coloured solution to ammonia—a test which any ploughman can undertake when instructed as to the mode. I have examined soils throughout Great Britain and Ireland, and have found the above mode an unerring one; and, having witnessed so many beneficial results from its application, I can with safety recommend it to all agriculturists.

Unless for the purpose of neutralizing humic acid, and rendering the silicates more soluble, it is a useless waste of money to apply lime to land. On some light lands, such as are to be found in Norfolk, &c., the application of calcareous matters have been found beneficial; in all such cases, however, the soil has contained a large portion of turfy substance (humic acid), intermixed with sand, gravel, &c. A first application of lime on such soils is most striking. It has already been shown that soils which give a brown colour to ammonia are infertile. The theory is this: plants require certain mineral substances as food, also ammonia; when humic acid is present, the potash, soda, and ammonia existing in the soil combine with the humic acid, forming a solution easily washed away by the rain, causing a constant impoverishment of the valuable inorganic constituents of the soil; for nothing is more certain than the fact that most of the valuable plants which are cultivated will not grow on a soil where free humic acid exists. This applies particularly to the cruciform plants (cabbage, turnips, &c.); and also to the leguminous ones (beans, clover, &c.)

I have already stated that my experience on this point is founded on observation made over the United Kingdom. By the perusal of a work published by Mr. Ruffin in the United States, the same causes appear to produce like effects. He says, in that extensive territory, "It will be sufficient for my purpose to show that certain soils contain *some substances*, or possess some qualities, which promote almost exclusively the growth of acid plants, and that this power is totally removed by the application of calcareous manures which would necessarily destroy any acid if it were present, leaving it to chemists to determine the nature and properties of this substance. I merely contend for its existence and effects, whatever it may be; for the want of a better name I shall call it acidity. Every cultivator of corn (maize, or Indian corn, is here meant) on poor light soils knows how rapidly sorrel will grow over his otherwise naked field, unless kept in check by continued tillage. This weed, too, is considered far more hurtful to growing crops that any other of equal size; yet it cannot thrive on the best land—sorrel* cannot even live on a calcareous soil.

"If the noxious quality which causes such injury is an acid, it is as certain as any chemical truth whatever that it will be neutralized, and its powers destroyed, by applying enough of calcareous earth to the soil; and precisely such effects are found whenever that remedy is tried. On land thus relieved of this annoyance the young corn (maize) no longer appears of a pale and sickly green, approaching to yellow, but takes immediately a deep healthy colour."

It has been asserted that tannic, oxalic, and even sulphuric acids, are to be found in soils. For my part I have never discovered any of them, although I have made a careful search. Oxalic acid may easily be tested by lime, and tannic acid by gelatine, or sulphate of iron (copperas); in the latter case ink would be formed. Indeed, sulphate of iron, said to be present in some soils, is incompatable with the presence of tannic acid.

It is in consequence of the known antiseptic qualities of the peat that it has been inferred that gallic or tannic acids are present; but it will be found, instead of sulphate of iron striking an inky colour to a solution of peat in an alkali, a dark-coloured precipitate, the humate of iron, is formed when mixed with a salt of iron. The main features of the preceding views of the action of calcareous manures was published by me a few years ago;† since which I have had abundance of opportunities of verifying their correctness, and also of receiving

* Rumex acetosella, or sheep sorrel.

† In the "Journal of Agriculture."

the acknowledgments of various parties that they have also found the statements therein made respecting the action of lime correct.

It it well known to all who have had to cultivate peat and moorish lands, and also those called sour clays, that an application of ordinary farm-yard manure, in however abundant quantity, produces very little fertilizing effects, unless lime has previously been applied; the reason of which is perfectly obvious, viz.: the union of the humic acid of the soil with the ammonia, potash, &c., of the manure, depriving it of its most valuable ingredients, converting that which should be a fertilizer in some degree into a noxious substance.

THE PROPERTIES OF VARIOUS KINDS OF LIME.

Limes for agricultural purposes may be classed into four groups, viz, limestone, including marble, chalk, oolite, mountain or carboniferous limestone, &c., which are nearly pure carbonates of lime, the per centage of silica, phosphate of lime, &c., being exceedingly minute. The silicated limestone, from which water mortars are made, are almost useless as manures, as they *set* with water; the earthy limestones, of which Bala Conistone and several of the older limestones principally consist, contain a considerable amount of earthy matter, frequently from 10 to 20 per cent., which unfits them for building purposes, but is generally liked for agricultural objects, as they are more easily burned, peat being used frequently for this purpose. Their effects are generally equal to that of lime made from pure marble, sometimes considered better, which can only be accounted for by the impurities containing a small amount of potash or phosphate of lime. *Magnesian limestone*, or dolomite: this limestone is converted by burning into lime and magnesia, in some places it is called mild lime. It is extensively used in Yorkshire for agricultural purposes; considerable disputes have taken place respecting some reported deleterious effects arising from the use of magnesian limestone, and experience shows that it cannot, with impunity, be applied in the same unlimited quantities that common lime may. To the fact of magnesia only slowly imbibing carbonic acid from the atmosphere, has generally been attributed the reported deleterious effects of magnesian limestone, and this accounts also for the fact of its being *more lasting*.

THE MODE OF APPLICATION AND QUANTITY TO BE APPLIED.

I have already shown the mode in which lime acts as a fertilizer, the consideration of which points out the manner and quantity to be applied; it will be evident that bogs and clays require the largest amount, the former in consequence of the great amount of humic acid contained therein, and the latter for the purpose of becoming intimately mixed with all the working soil, so as to free as large an amount of silicates and alkalies as possible; on neither of the soils named will much harm be done by over lining; on clays lime also assists in rendering them more porous. With regard to over lining, it may be stated that I never saw any injurious effects from over lining, but I have seen the most prejudicial ones from *over cropping*, that is, taking crops in succession from land without applying any other fertilizer than lime; it is this abuse of a valuable assistant to agricultural improvement, which, in many instances, has brought the practice of liming into disrepute. Soils in which there only exists very little calcareous matter, a dressing of lime has most beneficial effects, which can be most distinctly perceived on clover. In no instance is it necessary to apply more than a 100 bushels of lime to an acre, and that amount need only be applied to bog-land for the first time; on light sandy land mixed with moor, 50 will be found sufficient. It will be apparent, from what has been stated previously, that the chemical action of lime can only take place whilst in a state of solution; caustic (quick) lime rapidly absorbs carbonic acid from the atmosphere, forming carbonate of lime or chalk, in which form it is insoluble, except in combination with an additional equivalent of carbonic acid, by which means the bi-carbonate of lime is formed, which is only soluble in about 1800 times its own weight of water, lime being soluble in about one third of that quantity; it is evident, therefore, that by allowing lime to be converted into a carbonate we lose one-third of its use, and as lime when mixed with soil and made into a compost is thus converted into a carbonate, it is clear that we only apply an artificial marl, or an equivalent of ground limestone or chalk. In order to derive the whole of the advantages from an application of lime, it should be applied immediately from the kiln, and spread over the ground as early as possible. A mixture of lime and salt applied to dry soil, such as sand, is very useful, as an alternate decomposition and recomposition takes place, forming muriate of lime, and carbonate of soda; the muriate of lime is useful during droughts in keeping the soil moist.

ITS EFFECTS ON VARIOUS CROPS.

A few remarks will suffice as to its effects on various crops, the general principles having been previously dwelt on at some length. The leguminous crops will not grow to perfection without the presence of lime; the straw of the cerials is generally supposed to grow finer, and the grain to be cleaner, by an application of lime; the straw is, however, more brittle. With textile plants, such as flax and hemp, lime produces a deleterious in-

fluence in weakening the strength of the fibre; this may probably arise from the fact, that an excess of lime is held in solution in the juices of these plants, and absorbs a portion of the organic acids required to form the tissue. Turnips and potatoes are benefited by an application of lime; and, in fact, all crops grow what is termed "much cleaner," after the soil has been limed; and grass becomes sweeter, has a brighter green appearance, and is more relished by cattle after liming. Nearly the whole of these effects may be traced to the fact of neutralizing any small portion of humic acid existing in the soil.

HOW FAR HIGH CULTIVATION SUPERSEDES THE USE OF LIME.

Some soils cannot be brought into a high state of cultivation, except during a long series of years, without the aid of lime; bogs, for instance, if cultivated and constantly tilled and well manured for twenty years, would cut only a sorry figure at the side of a similar bog limed in the first instance, and subsequently well cultivated and manured; the former at the end of twenty years would present patches of sheep sorrel, from which the latter will be entirely free. Tillage has a considerable effect in improving the condition of soils containing humic acid; manure has also a beneficial tendency; but, when it is borne in mind how great is the loss sustained on applying manure on such soils unlimed, it will clearly appear that the most economical mode is to apply lime in the first instance: subsequent high cultivation will then for a long period prevent the necessity of recurring to lime.

The same remark applies to some cold clays. The rule to be followed should be, that all soils containing free humic acid shall have a sufficient quantity of lime applied at first to neutralize it, and its formation for the future should be prevented by perfect drainage and high cultivation. By following this rule, a second application of lime will not, under the generality of circumstances, be needed for half-a-century, even on lands inclined to be wet.

The generality of authors, when treating on the use of lime in agriculture, appear to have a vague idea that it ought always to be applied in quantities, because sometimes it is found more profitable to lay on a considerable amount; but, failing to produce any reasons for such a recommendation, they are frequently constrained to resort to the most far-fetched and improbable theories. The following may be taken as fair samples of this class of reasoners (?). Alluding to the exhaustion of lime by the growth of plants, they proceed as follows:—"It is found that lime forms a considerable portion of the ashes of plants. Hence, the reason why lime is regarded as a necessary food of plants, and hence also one cause of its beneficial influence in general agricultural practice. The quantity of pure lime contained in the crops produced upon one acre, during a four years' rotation, amounts on an average to about 200 lbs., equal to 360 lbs.—(say, 3½ cwt. of carbonate of lime, in the state of marl, shell-sand, or limestone gravel). It is obvious, therefore, that one of the most intelligible purposes served by lime as a chemical constituent of the soil is, to supply this large quantity of lime, which in some form or other must enter into the roots of plants. But the different crops which we grow contain lime in unlike proportions. Thus the average produce of an acre of land, under the following crops, contain of lime per acre in the:—

	Per acre.	Seed.	Straw or roots.	Total.
Wheat ..	25 bush.	1 lbs.	12 lbs.	13 lbs.
Barley ..	40 ,,	1½ ,,	15½ ,,	17 ,,
Oats	50 ,,	3 ,,	19 ,,	22 ,,
Rye	26 ,,	1½ ,,	15½ ,,	17 ,,
Beans	25 ,,	2½ ,,	34 ,,	36½ ,,
Turnips ..	20 tons	46 ,,	72 ,,	118 ,,
Potatoes ..	8 ,,	8 ,,	31 ,,	39 ,,
Red clover	2 ,,	— ,,	77 ,,	77 ,,
Rye grass..	2 ,,	— ,,	30 ,,	30 ,,

"These crops are not constant, and generally all our crops contain more lime when grown upon land to which lime has been copiously applied. But the very different quantities contained in the several crops, as above exhibited, show that one reason why lime favours the growth of some crops more than others is, that some actually take up a larger quantity of lime as food. These crops therefore require the presence of lime in greater proportion in the soil, in order that they may occur in the performance of these functions, or in the growth of those parts to which lime is indispensable." Accordingly, because a four-course rotation will carry away 200 lbs. of lime, or, say, 3½ cwts. of carbonate of lime; *therefore*, the farmer ought to supply his fields with 100 bushels, or about 3½ tons!!! of lime, the latter quantity being equivalent to supplying ten four-course rotations, or enough for forty years. The absurdity of this is manifest. It is, however, attempted to be bolstered up as follows:—"In connexion with the quantities of lime actually found in plants, another important circumstance must be taken into consideration; whatever kind or amount of food a plant may require to bring it to maturity, it must collect the whole during the term usually allotted to its growth. Thus, the longer a crop is in the ground, the slower it grows, and the longer it usually takes to come to maturity, the more time it has to collect food from the soil by means of its roots. Barley germinates and ripens its seed within three months—in Sicily sometimes within three weeks—while wheat is from six to ten months in the ground. The roots of barley, there-

fore, must do much more work in the same time than those of wheat. They must, amongst other things, take up the 17 lbs. of lime as noted in the above table in three months, while wheat on an average takes up only 13 lbs. in six months. Now, to effect this in the same soil, it must send out more roots in quest of this kind of food than the wheat plant will require to do, and thus it must waste more of its vegetable strength underground. But if we make the supply of lime in the soil more abundant, we diminish the labour of the barley plant, and greatly facilitate its growth. Thus we arrive at the conclusion, that the proportion of lime contained in the soil ought to be adapted, not only to the proportion which the perfect plant is found to contain and require, but to the period also which is allotted to its natural growth. For crops which run their course quickly a larger proportion of lime, as well as of all other kinds of food, will be required or will be beneficial, than for crops that are longer in coming to perfection. Has this fact anything to do with the earlier harvest upon well-limed lands, or with its peculiar fitness for the growth of barley?"

In a previous part of this series, I have shown from the analysis of the oat crop, that it is highly probable that the growing plant during its middle stages requires a larger amount of inorganic substances necessary for the growth of plants, as well as lime or its carbonate. To sum up, lime ought to be applied on sour pastures, bogs, and soils containing much humic acid soluble in alkalies, which once neutralized does not require to be limed again for many years.

PRACTICAL OBSERVATIONS ON THE CULTURE OF BEET-ROOT.

BY JAMES REEVE.

"Experience, with observation as its companion, will ever form the best guide for industry."

The views in this essay will most probably appear diametrically opposed to those of many of the agricultural community; but having nearly thirty years' experience in farming, and having devoted particular attention to the culture of the class of plants which form the subject of the present inquiry, I feel those views to be supported on the very best authority, illustrated by the specimens I had the privilege of laying before the Royal Agricultural Society; strengthened also by the opinions of many of the council of that body, and the corroboration of the various local associations, as well as the Dublin Society, &c. I am encouraged, under these impressions, to submit this short essay on the culture of the varieties of beet-root and mangold-wurzel.

Having witnessed in very many instances during the course of these last few years the various means used for the culture of the several kinds of beet-root and mangold-wurzel, I have had brought under my notice some which (in consequence of the impression that high manuring was absolutely necessary for their production) had occasioned a most expensive process; and many persons, for this reason, have been deterred from the attempt to cultivate the plant.

I have in several valuations, this present season, taken accounts—heavy accounts—paid for manures used in the preparation and growth of these crops. In some instances, besides the ordinary dressing of ten or twelve loads of the common yard manure, a considerable quantity of superphosphate of lime, sulphate of ammonia, pearl-ash, soda-ash, sulphate of magnesia, calcined bone-dust, muriate of ammonia, &c., and various other mixtures have been employed. In viewing these crops I could not but remark the very great unhealthines of their appearance; and it has occurred to me, in making a comparison with my own crops, that it is extremely doubtful whether the various manures used for the culture are suitable for the best product; on the contrary, I am more inclined to believe that many of the manures are extremely prejudicial to those plants, and tend to check the free circulation of the absorbing powers. In one instance I was thoroughly satisfied, when valuing a crop of roots, that they were in a most unhealthy condition; especially the leaves. These were spotted and deformed; in some instances yellow and lifeless, even to the hearts of them. This will at once account for the deformed and irregular state of the bulbs, for as soon as the absorbing powers of the plant are injured, the constitution of the whole is immediately impaired; and there is no remedy to restore them to health when once their vitality is affected. I consider this very succulent and susceptible foliage was injured by the evaporation of the manure used for their growth; for although the air and support enter every part of the plant, the chief admission (with the beet tribe) is through the leaves. The leaves of the beet are perhaps more succulent than those of any other plant in cultivation. Air-vessels are found in the leaves of all vegetables, but in the beet family they are more readily discovered; and

there is no doubt that air is inhaled by vegetables, and adds abundantly to their substance, for it supplies the properties most suitable for the plant. I have no hesitation in saying that it will soon be proved by analysis that the atmospheric air and the attracting powers of the plant, in combination, effect the formation of these bodies. The great aerial principle is of the utmost service in plants at all times and of all kinds; but for these in particular it has almost every requisite in itself for their perfection. Beet has so succulent a leaf that it may draw a great part of its nourishment from the air; and no doubt can exist (from practical knowledge) that there are many properties in the nourishment suitable for the beet class which contribute to their growth and produce; but the air contains most of them, and is the principal food for the beet.

Beet is considered by many an exhausting crop; but it is not so if its principal food is supplied by atmospheric agency, and by ploughing into the ground the immense quantity of leaves, containing the natural food for future absorption; thus returning into the earth much, very much of the natural ingredients and properties of the plant.

From the action of this principle it may be deduced that in every three or four years, whatever the course of system may be for fallow, for rest, or otherwise, a good crop of either beet or mangold-wurzel may be produced without the formidable outlay which has hitherto proved so discouraging in the culture of these valuable crops.

The beet may be considered an attractor to the various atmospheric agencies, as may be verified by its chemical contents. Manure may be applied to whatever crop you desire; but for a fine healthy crop of beet or mangold-wurzel, unencumbered by a quantity of forks and fibres, it is best to leave the chemical productions of the earth and atmosphere to form its chief feeding and nourishment; and although I believe the third or fourth-course system as that which would take in a proportionable part of a farm annually for this product, I have little doubt that by constantly burying the leaves in the earth a fair crop of beet or mangold-wurzel would be produced alternately on the same land. Some situations, some aspects, some counties may be more or less favourable, and the productions of the chemical properties may vary; still my plan would be the same.

It is fair to assert, without fear of contradiction, that the climate of Ireland is the most suitable and preferable for the production and growth of these bulbs; and the perusal of the very interesting pamphlet lately published by Professor Sullivan, will readily convey a most satisfactory conclusion on this head. The habits of all the beet family are much the same; although some kinds may be found to contain more saccharine matter, which will vary in richness of contents, in different specimens and growth.

In confirmation of the foregoing observations, I may be permitted to offer the experience of upwards of 25 years in the cultivation of beet and mangold-wurzel, during which time I have had the advantage of obtaining the opinions of the most competent judges on the produce of my crops. I will further illustrate this efficacious mode of culture by the produce of this present season, 1851, which is considered (throughout England) to have been more unsuitable for the culture of bulbs than any period within the last ten years. The following table exhibits the produce of four kinds grown this sesson; viz., White Silesian beet, Orange Globe, Rose Pink, and mangold-wurzel:—

		Tons.	cwt.	lbs.
White Silesian	per acre	38	17	96
Orange Globe	„	32	18	16
Rose Pink.....	„	31	10	9
Mangold-wurzel	„	39	13	6

I will here copy, from my book of valuations taken this season (Michaelmas), the cost of preparation of five acres of these roots, situated within two miles of my farm:—

A FALLOW—FIVE ACRES.

Four times ploughed,
Twice scarified,
Twice drag-harrowed,
Twice small do.
Two rollings,
Drilling,
Forty-six loads of yard manure,
Twenty-two hundred-weight of salt,
Six hundred-weight of superphosphate,
Two hundred and ninety bushels of ashes
Carting, spreading, five hoeings,
Rent, taxes, &c.

I have other valuations which I could cite, where guano and the other more expensive dressings are used; but I must leave this part of the present system of culture, which is already notorious for its expensiveness. I may here repeat:—Use whatever manure you please for other crops, but none for the beet; and I will now offer some additional proofs to the foregoing observations relative to my crops this season.

The land in question, when I grew the present roots, had been cultivated in the following rotation —wheat, peas, turnips (fed off), oats, and the last crop beans (1850), each year having produced most abundantly. Now it may be supposed from this process that the land never requires cleaning, &c. I acknowledge that it requires both restoring and cleaning; and I at once have recourse to my favourite plan in order to restore it to its good keeping. I have it once ploughed deep in March, harrowed and rolled: and about the last week in

April I drill in the seeds, about two feet apart in the rows. In this present month (November) I have the roots taken up and the leaves trimmed off, leaving about three and a-half tons per acre dispersed evenly over the ground. I then have them immediately ploughed in, and the wheat drilled, leaving the field perfectly clean, with no other dressing than the vegetable matter for my wheat crop; and by this process I find that I obtain the finest crops of wheat on my farms; besides, from the frequent hoeings, the land is perfectly clean and in fine working order. Though the land on this estate varies considerably, having both light loam and stiff loam, gravel, and clay, my plan is the same. After the present crop (wheat) I take a crop of clover, dress the ley for my second and third crop, and again grow beet or mangold-wurzel to clean the land for the wheat. It will be observed that I have named a third crop: this would be in proportion to my land; but if I required to grow these crops more frequently on the same land, I would undertake (without the smallest hesitation) to have a fine produce every alternate crop.

I have at present one field under this course. It was beans last season, and required cleaning and improving, having produced four crops since it had been manured. It was foul, as may be supposed, but is now perfectly clean, and drilled with wheat, with no other dressing; and I know from experience, that I have a safe prospect of a fine crop.

The great question, and I may say the only question now unanswered, is, "Do these roots, without manure, contain the same amount of saccharine matter as when freely manured?" It is said that the action of manure of every description has an important influence on the quality and amount of sugar; and although no positive experiments have ever been carried out to test the nature of such influence, a great deal of misconception appears to prevail upon the subject. I think most of the fears entertained on this point are groundless, especially (as Professor Sullivan says) when we recollect that several of the bulbs which he examined were grown on land highly manured. Now, whether the amount of substance is increased, and the saccharine juice improved, is still a question, so far as it relates to the ingredients suitable for making sugar, or even for producing the best results as a means for feeding stock; and, as the Professor remarks, "if animal manures cannot be employed, through fear of diminishing the amount of sugar, the profit of the farm will be diminished." Nitrate of potash has been found at some periods in the juice of beet-root; and it appears that as this substance increases the amount of sugar diminishes; and in some cases (observed by Peligot) disappears altogether. In confirmation of this, I will cite a case which occurred a few years ago on the estate of a Russian nobleman, Count Basil Brobrensky, who possesses a very extensive establishment, in the government of Toula, for the making of beet-root sugar. In the year 1846, the director of the works was surprised to find, when the sugar was taken from the moulds, that the greater part was almost completely changed into saltpetre, little more than 35 per cent. of saccharine matter remaining; in fact, some portions of the substance ignited more freely than, and burnt almost as fiercely as, saltpetre, from the remaining parts becoming charred. The gentleman who is my authority (a resident of twenty years in Russia) ignited some of the particles himself, and can vouch for the accuracy of the statement. After a careful investigation, the inference was that the excess of nitre was owing to the land having been too freely manured. It seems that these consequences, resulting from manure, frequently occur; for this gentleman assures me that in some instances, when the sugar is tolerably free from nitre, the treacle (molasses) is so impregnated with it, that it has been rendered unsaleable, being offered at £2 10s. per ton without meeting with a purchaser; so that it was afterwards used as a top-dressing for grain. From this it seems extremely doubtful whether high manuring, or even the liberal use of manure, is calculated to promote the best produce. If, therefore, such doubts exist as too high manuring for the family of beet, it is unnecessary for me to urge further the advantage of the system I have recommended. So simple and easy are the means, and so completely within the reach of every small farmer, that I hope many will try this method; and I am convinced that they will be induced every season to have a portion of their farm, let it be ever so small, cropped with beet or mangold wurzel.

The value of the roots is not sufficiently known, and the universal objection of the expense of preparing the land for them has greatly impeded inquiry into this desirable knowledge; for though the various uses to which the bulbs may be applied are tolerably well known, still they are not yet sufficiently appreciated. With the testimony of the Council of the Royal Agricultural Society of England, that of the Society of Dublin, and of the Surrey Agricultural Association, coinciding with the opinions of the most practical farmers in this and several of the adjoining counties, I am confident that this process will be adopted, even on poor land. Suppose one acre is grown for a trial, let me recommend a suitable space between the plants. Many who attempt to grow beet leave the plants too close to each other, which is objectionable in many respects, particularly for the hoeing

and cleaning. Let it be for a moment considered that if planted two feet apart, there will be a produce on the surface acre of 10,890 plants; that is, both two feet apart longitudinally and latitudinally, or lengthways and breadthways.

The white Silesian beet is incomparably the best for the manufacture of sugar; and the circumstance of its containing more saccharine juice than the other kinds at once proves the advantage of its culture for feeding purposes. Complaints have been made of its having its roots too much forked and too fibrous; this will not be the case if manure is not immediately applied to encourage these objections.

My views as to the inutility, and even injurious effect of manuring ground for beet crops, as especially detrimental to the production of the saccharine matter, receives further a remarkable and very timely support from a communication lately made by a gentleman conducting the beet-sugar manufactory now in progress at Mount Mellick, in Ireland (King's Co.), by which the quantity of saccharine in the roots examined appears to be in direct inverse proportion to the degree of preparation or manuring which the land had received. He states—

"I caused a root to be scraped, and on examining the product with a Beaume's hydrometer, I found the density of the juice to be 8 deg., thus indicating that a gallon of juice of this quality would yield 1lb. of sugar. The gallon of juice would weigh but little more than 8lbs., and from this I infer that the root contained not much below 12 per cent. of sweet constituent, which, allowing for molasses and waste, may be equivalent to about 10 per cent. of crystalline sugar."...."I have made a great many trials of beets from various localities. The specific gravity of the juice I find ranges to 7½, 8, and 8½ deg. (the latter is from Lord de Vesci's). One specimen of the white Silesian, a very large root grown at Mount Mellick in a garden which was highly manured, only indicated 5½ deg., proving that high culture *produces leaf, and diminishes the saccharine qualities.*"

Some farmers in my neighbourhood sell a part of their crop of beet or mangold wurzel, which is frequently as high as 20s. per ton; but probably a farmer would not, on a large quantity, realize this price. Well, let us value it at 10s. per ton for his various consuming purposes (I think it worth much more); this would pay him twice the value of an acre of wheat! Specimens of this produce I have been permitted to lay before the Council of the Royal Agricultural Society, who were pleased to pronounce them very fine roots; and I have also the opinion of their Professor of Chemistry, and those of the most practical and distinguished men in the profession, expressed in equally favourable terms.

Although many advantages may be gained by repeated ploughing, and turning over, and breaking the particles of earth for the produce of most plants, yet it is not so with the best culture of the beet or mangold wurzel, and the prevention of the evaporation from the soil is desirable for the accumulation of the suitable and natural ingredients. From so much of the atmospheric air being blended with the soil, a large portion of the oxygen may be supplied and retained; and this, with the union of carbon, and various other inflammable materials which the earth contains, would probably produce the carbonic or other acids requisite in greater abundance, and more suitably for the growth of the beet. Frequent hoeings also would bring it more minutely in contact with the portions of atmospheric air, and unite with it what has been covered in and pent up previously; and thus the supplies of ammonia, or volatile alkali, with the combination of its hydrogen with azote, would be more regular and more copious, as well as those of nitre, by the complete union of its superabundant oxygen, with some other portion of abounding nitrogen or azote of such air.

As the atmospheric air consists of oxygen and other fluid matters of heat, and these combined form the material, and produce the nitrous acid, or the oxygen in its fluid state, which is of great utility in promoting the growth of plants; and further, if any process of the putrefactive kind be going on where atmospheric air is in this way confined in the soil, the azote may combine with the hydrogen of the decomposing water, or contribute to decompose it, and after this has been completed is of very material use in promoting vegetation; while, at the same time, the oxygen afforded by the decomposing water may, like that of the atmosphere, contribute to the production of carbonic, nitrous, or phosphoric acids, and in this way will render the compound a basis quite capable of being taken in by the absorbent plants. Thus, by the course of nature, there is a production of both ammonia and nitrous acid, which are so suitable for the beet-root family, and so beneficial in promoting vegetation. It is then readily to be conceived that the process of fallowing land for the production of the beet-root or mangold-wurzel may cause some danger, by the natural ingredients being injured by too much evaporation and exposure; so that however plausible it may be to fallow land (and it would be difficult to persuade many people that it is not desirable), it may, as well as the use of manures, for the production of the roots, be essentially wrong, and tend to destroy the natural elements of the earth and air productions, and check the union

of such substances as form the compounds already alluded to.

It has been said by some writers, there may be other products of not less consequence arising from dissipation or loss of the carbonic or nitrous acids; so that although there may be much advantage in ploughing frequently to promote the best produce, in most crops it appears, from the success I have had at all times with my crops of beet-root, that the great mechanical alterations which must of necessity take place in the soil by repeated ploughings, and from the exposure of these compounds to the influence of the atmosphere, can in no way promote the improved production of the roots. Let it then be strenuously contended that the most judicious intermixture of crops upon every kind of soil will not preclude the necessity of a summer fallow. I doubt it very much; for I contend, from long experience, that a well-managed crop of beet-root or mangold-wurzel will clean the foulest land, and help to restore it to its required condition. But whatever advantage there may be in fallowing, and obtaining a perfect pulverization in this mode of cleanliness, it is a mistake to imagine it requisite to incur these heavy expenses to produce a fine crop of beet. Besides, the process of fallowing is almost destructive to the vital economy of nature in these plants. The loss sustained by the land remaining idle such a great length of time, by the prevailing system of fallow, cannot be disputed; why not, then, lessen the expense by a suitable and more profitable substitute—a substitute which will insure a still more luxuriant crop the following season, obtained by cleanliness and an ample supply of vegetable matter, the leaves being ploughed into the ground, in preference to their adoption for any other use hitherto sanctioned in rural economy?

We thus ensure, then, the fact that beet-roots may be grown every season in the same piece of land; the foliage of the produce of one season being a natural nourishment for the plant the following season: and to facilitate this process, I would suggest that trenches be dug out between the rows of plants, and when the crop is taken up and trimmed, to bury the leaves in the trenches, and fill them up with earth—these trenches to be considered to be the line for the succeeding crop—thus offering an abundant supply of the food and properties necessary for the next produce. This plan would be attended with very little more trouble; and I introduce the suggestion to afford a ready means for growing beet to those who hold but little land, or who could not conveniently extend such crops to other parts of their farm. It is known that there is no manure of vegetable matter so suitable for the growth of any kind of plant, and for bringing it to the greatest vigour and perfection, as the decayed produce of its own kind. Observe, as an instance, the stately oak, how it flourishes in the woods for several hundred years; it has no manure or assistance to the root, except the decayed leaves of its own produce; and what can be more natural? And the same with almost every other kind of plant; each is best nourished by the decomposed leaves, stalks, seeds, &c., of its own produce. The system extends even to the economy of animal life, if we may draw an inference from the eagerness with which all the rapacious classes of animals devour their own kind; and from the experience of fishermen, it is shown that the most attractive bait for every kind of fish is the flesh of one of its own species.

From all the information I can collect, plants grown without the assistance of any kind of manure contain as much, and in many instances more saccharine matter, than those to which such artificial means have been supplied, and which consequently would be grown only at a much greater expense.

Should such a result as that which, from experience, I consider sufficient to be acted on as the basis of a practical system, be adopted in the culture of the saccharine-bearing plants, either for feeding cattle, or for the manufacture of sugar, we shall have overcome the most plausible and striking objection to the cultivation of those roots for extensive agricultural or commercial purposes, namely, the supposed great expense, from the necessity of high manuring, and of periodical fallow, both of which, to the farmer of small capital and limited extent of land, would prove almost an insurmountable obstacle to its profitable cultivation; and a very important step will thus be made in the advancement of this branch of agriculture, and in promoting the more extended use of so valuable a class of plants as that of the beet family.

Randall's Park Farm, Leatherhead, Surrey, Sep., 1852.

THE SPURRY—HOW TO DESTROY.

We have somewhere heard of a landlord who made it his practice, when he found a farmer growing weeds, to immediately advance his rent, alleging, that if he were able to afford to grow weeds, he was certainly in a position to pay more rent. This is a capital anecdote for the gentlemen of the Man-

chester school, who catch at such general and sweeping principles, and allege that this is a certain cure for bad farming. But on this as on most subjects, a little learning is a dangerous thing, and the most learned men in all points are always found the most reserved and moderate in their opinions; for to know a subject well is to see that most of sweeping assertions will not bear deep investigation, but require fencing with limitations and exceptions, which make a real truth-seeker anxious not to overstate, and so his opinion is not a little modified. As a rule, bad farming and weeds doubtless go together, and high cultivation has for its object, *inter alia*, the destruction of weeds; but it will sometimes happen that it is a great struggle to keep them down, and a struggle in which, we are sorry to say, the farmer is not always successful, nor the plants always victorious over the weeds.

We have spoken of those which may properly be called *root weeds*, not because they spread in their roots alone, but because the root is the real cause of damage to the soil, and because it is by far the most difficult part of the plant to exterminate.

There is a class of weeds, however, equally injurious, exhausting to the soil, and poisonous to the crop, by their disputing the ground, forcing up their little leaves to suck in the nutritive air, and smothering, in fact, the whole of the land: we mean such plants as the spurry, the poppy, and the charlock.

Taking the first in order—the spurry—it is a plant which often conquers a corn crop. Small and insignificant at first, it grows so rapidly, is so hardy, so thick in its pointed foliage, and comes up in such force, that it often chokes a crop on land in good condition, as far as manure is concerned. Hoeing is of comparatively little value, for there is enough in the drills, when it is abundant, to tiller out further than the corn; and as it comes up long after the corn, it is impossible to eradicate it while a corn crop is on the ground. And then to see how it grows! it seems to be instinctive with the race it has to make to seed before the corn is carted, and all its energies are directed to this purpose, and it always succeeds. A smother of spurry is followed by a cover of plant seeds, and these lay the foundation of not another, but a series of future crops.

It is common to a class of soils peculiarly its own—light blowing sand seems to be its favourite, and it is doubtless supplied by Providence to fix by its rapid career the loose sand, which otherwise would fly off almost out of sight. The farmer looks not at this. He wants corn; and the spurry in fixing the sand fixes also his crop, for in such situations it is generally worthless. Now here, as hand and horse hoeings are useless, another process will be necessary. It can make no head in green crops. It never injures turnips, because they are sown too late for it to make great heading; and when it does appear, they are not only hoed between the rows, but single plants are also hoed round, so that it has absolutely no space to grow in, untouched by the hoe; and even if a plant should happen to escape, the frost sets in before it can seed, in the ordinary run of years. Hence turnips are of all others the best crop to keep it down. But if the soil is full of the seed, it will be essential to get a large portion of it to germinate first. We would recommend treatment in earnest of the following kind, where claying was not adopted, for this is a certain cure—no clay land ever has the weed upon it in any quantity; but as this is a landlord's operation, we pass it over, and suppose the land to be treated by a tenant:—Suppose the field is taken after wheat, and the stubble cleaned in the autumn: the land should then be ploughed and harrowed fine, so as to present a flat surface through the winter. A few will thus germinate. In spring, another ploughing will destroy these, and a harrowing should again be given, so as to leave the surface flat, in order to allow the moisture to accumulate, and strike the seed; for as soon as this is accomplished, another ploughing and harrowing will repeat the process. This should be continued as long as possible—if through all the summer it will be a more perfect cure; but as some crop is usually taken, a crop of rape, sown in July, will give a very ample time to turn over fresh surfaces, and no time will be allowed for the seed to be shed. The next crop may be tares, mown off, which will necessarily take place long before the seed will have time to do any damage; and a succession of ploughings and harrowings of the tare stubble would again destroy the spurry, and clear the land for another crop. In the third year, mustard sown in March, and eaten off, will again prevent the spurry: this should be ploughed, and sown with rape, or stubble turnips—also to be eaten on. Here would be time saved, and the weed kept down. A crop of oats and small seeds might then follow, for the land would be too much consolidated to admit of much headway being made by the marauders, and the seeds would in some measure occupy the soil in good condition, so as to render it probable that a crop of early oats might be reaped before the plant caused any serious inconvenience, thinned as it had been by the previous cultivation.

By this, or some such process, must the soil be freed from such plagues asserting their native rights over the exotic plants cultivated by the husbandman for profit, for weeds are almost a necessary consequence of frequent crops of corn.—Gardeners' and Farmers' Journal.

AGRICULTURAL BIOGRAPHY.

(Continued from page 218).

XXII.—Digges, 1631.

Leonard Digges was born at Digges' Court, in the parish of Barham, Kent, in the early part of the 16th century; died about 1570. He was an able mathematician, and wrote several geometrical works, some of which were edited by his son, Thomas Digges. The book on surveying is called "Tectonicon," briefly showing the exacte measuring and spedye reckonynge of all manner of land, and squares, tymber, stones, steeples, pyllars, globes, &c.; London, 1556, 4to. Again, in 1570 and 1585, republished by his son; London, 1592, 1637, 1647, and 1656, 4to. Weston ascribes to Digges "The shepherds' calendar," in folio, with wooden cuts, black letter, 1631; but no list of the author's works notices any book of that name.

The first editions of "Tectonicon" are printed in black letter, and the latter copies contain 60 pages of small quarto. The geometrical figures are drawn in the usual way, and the dotted lines show the taking of dimensions. Good rules are given for surveyors, joiners, masons, carpenters, &c. The book was much esteemed, and passed through several editions.

XXIII.—Levet, 1634.

John Levet, Gent., wrote "The ordering of bees; or, the true history of managing them from time to time, with their honey and wax;" London, 1634, 4to. The book contains 71 pages of continued dialogue between two persons, "Tortona and Petralba," and shows an accurate knowledge of the management of bees, discussed in the usual way of those times.

XXIV.—Calthorpe, 1636.

Charles Calthorpe, of the Honourable Society of Lincoln's Inn, Esq., was the author of the work entitled "The relation between the lord of a manor and the copy-holder, his tenant;" London, 1636. The contents are said to be the learned readings of that excellent and famous lawyer, the name above written, and fill 100 octavo pages of a large size. It is a legal production of very considerable value in the opinion of qualified judges.

XXV.—Remnant, 1637.

Richard Remnant wrote the "Historie of bees," shewing their nature and usage, and the great profite of them; whereunto are added the causes and cure of blasted wheat, hops, rie, and fruit; and the causes of smutty wheat. The book fills 45 octavo pages, in which the bee is treated in the usual way. Wheat is blasted by windes, or by mildewes, which last are cured by running a rope over the wheat, held by a person at each end. Smut in wheat arises from the seed and land, or both; it is cured by steeping the wheat in a certain ingredient, to be afterwards made known by the author.

XXVI.—Plattes, 1638.

Gabriel Plattes lived in the reigns of Elizabeth, James I., and Charles I., and during three or four years of the Commonwealth. He was an ingenious and very adventurous writer, and did not deal much in practical facts. He wrote "Treatise of husbandry," London, 1638; "Discoverie of infinite treasure, hidden from the worlds' beginning, in the way of husbandry," London, 1636, 1639, 4to.; "Discoverie of subterranean treasure, in all manner of mines and minerals, from the gold to the coal, &c., with directions for finding them," London, 1639; "Observations and improvements in husbandry, with twenty experiments," London, 1639, 4to.; "The profitable intelligencer," London, 1644, 4to.; "Recreatio agriculturæ," London, 1646, 4to.

The first and last-mentioned works are not found in the British Museum—a matter of regret, as the books appear from the title to have been the most practical of the author's productions, and qualified to show the merits of the writer. The two "Discoveries of treasures" are bound together, and form a thin quarto of 92 pages. The "Profitable intelligencer," communicating his knowledge for the general good of the commonwealth and all posterity, contains 8 pages of quarto size, bound in a volume of letters and sermons of that period. The subject is in the form of a letter, and contained in vague and trifling speculations without any definite prescription.

The writers who immediately followed Plattes all allowed his genius—that he had a bold adventurous cast of mind, and preferred the faulty sublime to the faulty mediocrity—that he was an original genius, and an ingenious writer—a singular honest man—and that he had as excellent a genius in agriculture as any man that ever lived in this nation before him. It seems he was a very needy person, and was much relieved by Hartlib, to whom he bequeathed his unpublished papers. It is said he was found dead in London streets, in a

state of extreme destitution, and that he was very much neglected during his whole lifetime. This statement has been contradicted, without any better account being substituted. Weston gives to his name "The Jewel-house of art and nature," which is known to have been the work of Sir Hugh Plat. Nothing has been discovered of the origin, lineage, or place of nativity of Gabriel Plattes.

XXVII.—Vermuiden, 1642.

Sir Cornelius Vermuiden was a Dutchman by birth, and held the post of colonel in the army of Cromwell. He wrote "A discourse touching the drayning the great fennes lying within the severall counties of Lincolne, Northampton, Huntington, Norfolk, Suffolk, Cambridge, and the Isle of Ely, as it was presented to his Majestie;" London, 4to, 1642. The work is bound singly in a thin quarto size, and occupies 32 pages. It was ordered to be printed by the Committee for the Great Level, together with the mappe, in order that exceptions may be taken (if any be), and other designs may be offered. A local knowledge of the ground was at any time requisite to understand any plan devised for draining the fens, and now, when so many alterations have been made by the subsequent operations, any reference to Vermuiden's designs would be wholly misspent labour; but at the time he wrote on the subject it seems no objections were raised against his schemes of embanking the rivers and draining the swamps.

XXVIII.—Weston, 1646.

Sir Richard Weston, of Sutton, in Surrey, was Ambassador from the Court of James I. in 1619, to the Elector Palatine, and King of Bohemia. He wrote "A discourse of husbandrie," used in Brabant and Flanders, shewing the wonderful improvement of land there, and serving as a pattern for our practice in this commonwealth; 4to, 1645. This book is issued under the name of Hartlib, to whom the MS. was addressed, without the author being known. Sir Richard also wrote "Brief discoveries of ways and means for manuring and improving land," 1646.

It has ever been acknowledged that Sir Richard Weston laid the foundation of the improved agriculture of Britain. In the low countries of Brabant and Flanders he saw the clover plant, and also the turnip, both of which very much attracted his notice, and induced him to state their qualities in writing, and recommend their use to his countrymen. The genius of the British people was then rapidly bestirring itself, and sought every avenue of development. Weston's book has always been reckoned an excellent work, and shall have the due examination in the following author's life.

XXIX.—Hartlib, 1646.

Samuel Hartlib was the son of a Polish merchant, who settled at Elbing, in Prussia, where he built the first house of credit, and established the English Company there. His family was of a very ancient extraction in the German empire, there having been ten brothers of the name of Hartlib. Some of them were privy councillors to the Emperor, some to other inferior princes, some syndics of Augsberg and Norimberg. He was the issue of a third wife, his father having married two Polonian ladies of noble extraction. His third wife seems to have been an Englishwoman, for she had two sisters very honourably married here: one first to a Mr. Clarke, then to Sir Richard Smith, and a third time to Sir Edward Savage; the other sister married Mr. Peak. Warton says Hartlib came over into England about 1640. He carried on an extensive agency business, and engaged himself with literary subjects. He wrote several theological tracts, and was the esteemed associate of the talented men of his time, including Milton, who dedicated to him his "Tractate on education." He assisted in establishing the embryo of the Royal Society. The time of his death is unknown.

Hartlib published "Discourse of husbandry used in Brabant and Flanders, showing the wonderfull improvements of land there;" London, 1645, 1650, 4to. "Legacy; or, an enlargement on the discourse of husbandry used in Brabant and Flanders," with an appendix; London, 1651, 1652, 1655, 4to. "Essay on the advancement of husbandry and learning, with propositions for erecting a college of husbandry;" London, 1651, 4to. "The reformed husbandman; or, a brief treatise of the errors, defects, and inconvenience of our English husbandry, in ploughing and sowing for corn, with the reasons and general remedies, and a large, yet faithful offer or undertaking, for the benefit of them that will join in this good and public work;" London, 1651, 4to. "Discovery for division or setting out of waste land in England and Ireland." "The complete husbandman; or, a discourse of husbandry both foreign and domestic."

It has been noticed that the "Discourse on Flemish husbandry," was written by Sir R. Weston, and published by Hartlib; in like manner the "Legacy" was compiled by R. Child, and other persons eminent for skill in agriculture. Hartlib himself never had any practice or connection with agriculture, but received it through the medium that was presented to him. "The husbandrie of Brabant and Flanders" occupies 27 pages of small quarto, and details the practice of those places through which Sir Richard Weston had travelled, in the use of flax, clover, and turnips; Devon-

shiring (paring and burning) of land is much recommended, and to sow clover and turnips upon the ground thus treated. Flax, turnips, and clover were at that time grown in England, but differed as much from the crops in Flanders as the wild plants differ from those raised in a garden. The language shows a learned author, and the germs are evident of an improved agriculture.

The "Legacy" forms an enlargement of the former work, adding the best performances of English practice on the knowledge which the author possessed, or could learn of its use. The work was only drawn up at Hartlib's request, and, passing through his correction and revision, was published by him. It consists of one general answer to the following query, namely: "What are the actual defects and omissions, as also the possible improvements, in English husbandry." The real author was Robert Child, as was before noticed. To it are annexed various correspondences from persons eminent for skill in agriculture at this time, as C. D. B. W. R. H. T. Underhill, Henry Cruttenden, W. Potter, &c.; as also, the "Mercurius lectificans," and twenty large experiments by Gabriel Plattes; together with annotations on the "Legacy," by Dr. Arnold Beati; and replies to the animadversions, by the author of the "Legacy." In the preface Hartlib greatly laments that no public director of husbandry was established in England by authority, and that we had not adopted the Flemish custom of letting farms upon improvement.

The "Legacy" occupies 131 pages of small quarto, and treats sainfoin, lucerne, ploughs and carriages, digging, setting and hoeing, gardening, smut and mildew, orchards, fruits, vines, hemp and flax, dunging and manuring lands, the net improvement of our mead, waste lands, woods, bees, silkewormes, ignorance of the husbandry of other places, ignorance of things taken from the earth and waters of this island, the ignorance of the vegetation of this island, and their virtues and uses, animals, diseases of cattle and their cures, feeding and fatting of cattle, want of things necessary for improvements, want of God's blessing on our labours. Upwards of twenty pages are occupied by letters to the author on the various subjects that are treated in the work The manures enumerated are - 1. Chalke; 2. Lime; 3. Ordinary dung (excrements); 4. Marle; 5. Snaggreet (shelly earth from river beds); 6. Ouse from marsh ditches; 7. Sea-weeds; 8. Sea sand; 9. Folding of sheep; 10. Ashes of any kind; 11. Soote; 12. Pigeon's and hen's dung; 13. Malt dust; 14. Salt and brine; 15. Grassy turf and brakes; 16. Fish; 17. Urine; 18. Woollen rags; 19. Denshyving, or paring and burning lands; 20. Mixture of lands; 21. Enclosures; 22. Steeping of graines; 23. Lupines, and ploughing green plants into the ground.

The "Reformed husbandman," or the notice of the errors and defects of English husbandry, fills 14 pages, and is bound with the "Legacy." This essay was imparted to Hartlib by some one of his correspondents, whose name is not given, but who recommends industry as the grand forge of inventions, and the source of all rewards; and

> "'Tis only need
> Gives life and scope to every human seed."

The author urges the fallowing of lands for any crops, and to use much less seed. He also recommends that much more expenditure be made in order to procure the jewels of nature.

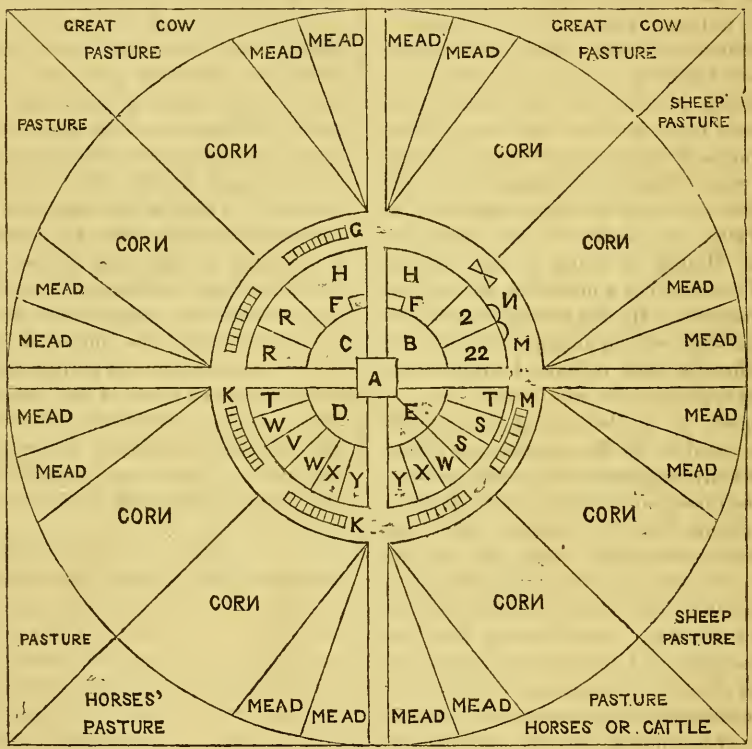
In the "Essay on the advancement of husbandry learning" Hartlib ascribes all misery to the narrowness of our spirits, and that our hearts are not enlarged beyond ourselves. If the advantages that are offered were held, and made jointly serviceable, fruitful and lucriferous employments would never be wanting, and are only unfruitful because we mind not the objects of that industriousness which, without a mutual concurrence, cannot be advanced. There are infinite means of relief and comfort for all sorts of calamities, to be found in nature and well ordered societies, if men were not enviously, or covetously, or peevishly, or ambitiously, or drowsily straitened within themselves. In order to rouse the upright in heart from the laziness and drowsiness, he states "that the mother of all other trades and scientifical industries, which is the science and trade of husbandry, would be very beneficially treated in the collegiate way of teaching the art thereof: for if the least part of industry is highly improved by collegiate institutions, the chief parts, which are the root of all wealth, must be advanced to perfection by that means."

In order to promote what the author calls "the most ancient, most noble, and most necessary trade of all others," he proposes that there be bought or rented a large and convenient house, with some good quantity of land adjoining and belonging to it, and that it be done "by those whose great wealth is joined with as great virtue and love to their country, and will as well as power to advance the public good without seeking their own private benefit." He advises the money necessary to be raised by contributions, according to the wisdom and means of the donors. To those, whose good will may be large but the means are small, he offers £20 yearly for every £100 that is lent, and so for a greater or less sum proportionably; and, on notice of six months, the sum dis-

bursed will be repaid. In order to ransom ingenuity from her too tedious captivity, and to awaken industry from a kind of lethargy, young men of 15 years of age and upwards are to be bound for 7 years as apprentices in agriculture, and in that time to be instructed faithfully in the theorick and practick parts of this (of all others) most ancient, noble, and honestly gainfull art, trade, or mystery; and, at the end of that time, he shall receive at one entire payment, to set up withal, £200; and at the end of every year following that payment for the period of four years he shall receive £50 more, the better to support him, till he have taken sufficient root. The sum of £20 is paid by each student on entering. The number of pupils is limited to 36.

Freemen can be entered on paying £50, who must prove themselves to be well-wishers and professors of good husbandry. It is not the newness, but the rarity or invalidity of any invention, that lays it open to the dislike of the more wise and noble persons. The author does not pretend to make bread of stones, but only to make better bread of the same wheat, and to screw the most profound mystery of good husbandry a note or two higher, and to do the same thing a better way and to more advantage.

A correspondent of Hartlib, named Coressey Dymock, sent him the plan of a farm, which might be adopted on newly-enclosed land, as fens recovered from the sea, and river overflowings, and upon common grounds, being divided into farms. The design is subjoined:—



This chart is the plot of an entire lordship, or it may serve for a farm of 200 or 300, or any number of acres—

A is the dwelling-house in the centre.
B, the kitchen garden.
C, the orchard.
D, the choice garden.
E, the physicall garden.
F F, the dairy and laundry.
G G, sheep cotes.
H H, the closes for cows.
I I, the bakehouse and brewhouse.
K, the great corn barn.
L L, stables or houses, swine's styes.
M M, little houses, for poultry, &c.
N N, the standing racks.
O O, coney berries.
Q Q, closes for single animals.
R R, closes for mares and foal, &c.
S S, pastures for sheep.
T, closes for weak purposes.
V, pastures for fat beeves.
W, close for diseased beasts.
X, close for saddle-horse.
Y, close for weaning calves.

Another plan is given of a large square form, which is divided in the interior into a number of equal sized farms, that are also square in shape and very regularly placed. However eligible may be the square form of fields and farms, the adoption of the circle seems liable to many objections, in making very narrow corners, which are always inconvenient, even though the land be constantly in pasturage. It is a whimsical rather than a useful designation of land, and is given here as a mark of the ideas that prevailed in those times when agriculture began to be stirred in Britain, and from which the present improvements derived the propelling force.

Hartlib looked sublimely, and thought very deeply, as is shown by the projects which he formed and the recommendations he imparted. He was able to urge the adoption of arrangements that were beyond the interest of self, a circumstance the more wonderful as he was engaged in commercial agencies, which, of all other employments, rivets the mind most closely to the money column in the accounts of human transactions. His acquaintance with Milton, and estimation by that immortal man, and the correspondence with Sir William Petty, are sufficient to stamp the character of Hartlib as being a very superior person, and possessed of a mind that was moulded of refined materials. He was noticed by Cromwell, who presented him with an annuity of £100 yearly, which is otherwise said to have been given him from a direct application for relief, which was made on the grounds of his benevolent philanthropy. He was neglected at the Restoration, and his services were wholly forgotten—his pension was £700 in arrear; he presented a petition to the House of Commons, setting forth his services and praying relief, in which, among other things, he says, that "for thirty years and upwards he had exerted himself in procuring "rare collections of MSS. in all the parts of learning, which he had freely imported, transcribed, and printed, and sent to such as were most capable of making use of them; also, the best experiments in husbandry and manufactures, which, by printing, he hath published for the benefit of this age and posterity." In a letter to Lord Herbert he complains "he had nothing to keep him alive, with two relations more, a daughter and a nephew, who were attending his sickly condition." The result of these applications, and the time of the death of this ingenious man, are unknown—his history stops short at this point. It is recorded that Hartlib was a kind relieving friend to Gabriel Plattes, and that he lodged and maintained Speed in his house whilst he composed his book of improvements in husbandry.

About the time when Hartlib flourished, seems to be an era when English husbandry rose to a high perfection, for the preceding wars had made the country gentry poor, and, in consequence thereof, industrious—though sometimes the reverse of this happens in many kingdoms; but these wise men found the cultivation of their own lands to be the very best posts of employment. Yet, in a few years, when the Restoration took place, all this industry and knowledge were turned into dissipation and heedlessness, and then husbandry passed almost entirely into the hands of farmers.

The notice of the life of Hartlib must not be closed without a parting expression of profound regret, that the lofty minds which are excited by the prospect of future good, and rise above the general allurement of immediate advantage, should ever be subjected to the painful necessity of making petition for relief, either by private or public solicitation. Such occurrences have not been unfrequent in the history of the world, and afford ample evidence that there is something wrong in the moral condition of society that permits the very highest benefactors of the human race to be degraded almost beneath the situation of menial servitude. A tithe of the tenth part of the money that was squandered under the restored monarchy of England, in upholding scenes of debauchery and maintaining the tools of a very depraved morality, would have supported in an easy and becoming competence the author of the "Legacy," and the propounder of an agricultural college, who was the esteemed friend of the immortal author of "Paradise Lost," and who held correspondence with the talented founder of the noble house of Lansdowne. These are painful reflections, and put to shame every boast of civilized life.

XXX.—Blythe, 1649.

Walter Blythe, or Blyth, was a Yeoman of Yorkshire, and acted in a military capacity in the army of Cromwell. Along with other commissioned persons of those times, he was very eminently useful in introducing improvements into Scotland and Ireland. He wrote two agricultural works: I. "The English Improver; or, a new system of husbandry," in six chapters of 168 quarto pages; London, 1649. II. "The English improver improved," of 262 pages, containing the former work, with addition of six new pieces of improvement; London, 1652. The six chapters first published are—1. On floating and watering lands; 2. On draining fen and boggy lands, and regaining lands from the sea; 3. On such enclosures as prevent depopulation, and advance all interests; 4. On tillage of land kept too long in grass, and pasturing others destroyed with ploughing; 5. Discovery of all soils and composts, with their nature and use;

6. On doubling the growth of wood by new plantations. The second part contains six newer pieces of improvement—1. On the husbandry of clover and St. Foyne; 2. On lessening the charge and burthen of the plough, with divers figures thereof; 3. On planting wild wood and madder; 4. On planting hops, saffron, and liquorice; 5. On planting of rape, coleseed, hemp, and flax, and the profit thereof; 6. On the great advance of land by divers orchards and garden fruits. The work is dedicated to the Lord Protector, and to other public bodies.

The writings of Blyth contain a great deal of sound sense, and not badly expressed, on almost every branch of husbandry. His principles are very correct, and he seems to have entertained the first systematic conceptions of the benefits that would attend the alternate husbandry. He recommended the breaking up of all inferior grass lands, and shows the public loss from constant pasturage, and also the individual detriment. The wearing out of lands by too constant ploughing is much condemned, and the want stated of a renovating pasturage.

Blythe relates as a curious circumstance—"It is not many years since the famous city of London petitioned the parliament of England against two nuisances or offensive commodities which were likely to come into great use and esteem, and that was Newcastle coal in regard of the stench, and hops, as they would spoil the taste of the drink and endanger the people."

Blythe mentions the previous writers on agriculture, as Markham, Googe, Tusser, and Plattes. He knew Hartlib, but makes no particular notice of him. He says Plattes was very rationall and ingenious, and Tusser rimeth out of his experiences. No mention is made of turnips, though the plant was known before his time. He describes and figures the swing and wheel ploughs, and the double implement with two mould boards; and notices the turnwrest plough of Kent. The form and construction of the plough had much improved since the delineations had been given by Markham only twenty years previous, as is seen in the convexity of the mould-board and the greater length of the handles, which begin to assume the present curvature of junction with the body of the implement. These points constitute the most essential requirements of an efficient plough.

It has always been most truly stated, that the foundation of British agriculture was laid by Sir Richard Weston, Hartlib, and Blythe, by the notice and recommendation of the green fodder-plants, which, along with root crops, effected a most complete revolution in the cultivation of the British soil. The change of government introduced by the Commonwealth brought forward upon the stage of life many eminent characters, who, but for that change, would not have been heard of; and, whatever opinions may be formed of that form of government in other respects, no denial can be made to its being favourable in a very high degree to the development of genius and enterprize. For the long period of upwards of one hundred years from the time we write, little or no improvement was done in the practice of agriculture, till a similar social commotion moved the stagnation of the human mind, and put into motion the wheels of action that had stood still from want of impulse and the oil of progression. Green crops in the root and fodder plants budded in Hartlib and Blythe, blossomed in Tull, and were rich in fruit in Dawson, Culley, and Brown; and it was only from these enlightened practitioners that agriculture received the benefits of a sound practice and profitable results: so slow is the progress of truth even in the grandest form of attire.

Of the birth, native country, and lineage of Walter Blithe, his social existence, married or single life, issue, or death, no memorials exist, and it does not appear that any record had been made.

XXXI.—Lee, 1656.

Reverend Joseph Lee was a minister of the gospel, and seems to have been a dissenting clergyman in Leicestershire. He wrote "A vindication of a regulated enclosure," wherein is plainly proved that the enclosures of commons are both lawful and laudable. The essay occupies 36 octavo pages, and is forcibly written.

XXXII.—Sha, 1657.

J. Sha wrote "Certaine plaine and easie demonstrations of divers easie wayes and meanes for the improving of any manner of barren land, though the same be not worth 1s. an acre, and showing how to make the same become worth 20s., 30s., or 40s. an acre yearly." The essay occupies only 16 pages of small quarto, which relate to ploughing, dunging, and soaking lands with water.

XXXIII.—Evelyn, 1658.

John Evelyn was a great philosopher, a worthy patriot, and a learned writer in the seventeenth century. He was descended from a very ancient and honourable family, which flourished originally in the county of Salop, at a place still called Evelyn. George Evelyn, Esq., purchased the estate of the family at Wotton, in Surrey, in the reign of Queen Elizabeth, and left a large family. The youngest and only surviving son was the father of our notice, who was born October 31, 1620, in the paternal house at Wotton. His tender years were much

indulged by his maternal grandmother at the Cliff, near Lewes, in the county of Sussex, where he received the first elements of learning at the grammar school in that town. In 1637 he removed to Baliol College, Oxford, where, as a gentleman commoner, he remained till the breaking out of the civil war, when he repaired to the king at Oxford, and obtained a leave, signed by his Majesty, to travel beyond seas for his improvement. His college tutor was a Mr. Bradshaw, related to the president at the trial of Charles I.; and he always mentioned the person as a "nomen invisum." Evelyn entered the Middle Temple in 1640, and at this time he lost his father, who died in his fifty-third year. The ominous appearance of public affairs, by the trial and death of the Earl of Strafford, inclined him to pass some time abroad, and he immediately visited Holland. In 1642 he offered his services to the royal cause, and was a volunteer in Prince Rupert's troop; but the movement of the army having left his property exposed to the rebels, he was advised to travel, in order to conciliate neutrality, and in 1643 passed through France into Italy. In the eternal city, the mother of arts as well as of arms, he indulged his thirst for knowledge, which was ever the ruling passion of his life; and his mind having been previously prepared, the stock he acquired was proportionally large. In France and Italy he left no curiosity unexplored, and at Paris was introduced to Sir Richard Brown, the English king's minister there, whose daughter he married in 1647, and had with her the possession of Sayes Court, near Deptford, in Kent; to which place he retired in October of that year. He published a tractate on liberty and servitude, for which being severely threatened, he again retired into France, and attended his father-in-law when, after the death of Charles I., he delivered his credentials to the French court as the minister of Charles II. He spent seven years in his travels, and returned to private life with a vast store of varied knowledge. His studious disposition at this time produced, in a letter to the Honourable Robert Boyle, the raising of a kind of a college for the reception of persons of a philosophic turn of mind, where they might enjoy the pleasures of agreeable society, and at the same time pass their days without care or interruption. As this idea will ever remain a grand conception of the human mind, the pages of our biography cannot be better occupied than in transcribing the proposition at full length. Evelyn's plan was thus formed:—"I propose the purchasing of thirty or forty acres of land in some healthy place not above twenty-five miles from London, of which a good part should be tall wood, and the rest upland pastures or downs, sweetly irrigated. and were there not already a house which might be converted, &c., we would erect upon the most convenient site of this, near the wood, our building, viz., one handsome pavilion, containing a refectory, library, withdrawing-room, and a closet. This is the first story, for we suppose the kitchen, larders, cellars, and offices to be contrived in the half-story under ground. In the second should be a fair lodging chamber, a pallet-room, gallery, and a closet, all which should be well and very nobly furnished, for any person that might desire to stay any time, and for the reputation of the college. The half story above for servants, wardrobes, and like conveniences. To the entry fore front of this court, and at the other back-front, a plot walled in of a competent square for the common seraglio, disposed into a garden, or it might be only carpet, kept curiously, and to serve for bowls, walking, or other recreations, &c., if the company please. Opposite to the house, towards the wood, should be erected a pretty chapel; and at equal distances, even within the flanking walls of the square, six apartments or cells, for the members of the society, and not contiguous to the pavilion, each whereof should contain a small bed-chamber, an outward room, a closet, and a private garden, somewhat after the manner of the Carthusians. There should likewise be an elaboratory, with a repository for varieties and things of nature, aviary, dovehouse, physic-garden, kitchen-garden, and a plantation of orchard fruit, &c.—all uniform buildings, but of single stories, or a little elevated. At a convenient distance, towards the olitory garden, should be a stable for two or three horses, and a lodging for a servant or two. Lastly, a garden-house and conservatory for tender plants. The estimate amounts thus:—the pavilion, £400; the chapel, £150; apartments, walls, and outhousing, £600; the purchase of a fee for thirty acres, at £15. £1,600 will be the utmost. Three of the cells or apartments —that is, one moiety with the appurtenances, shall be at the disposal of one of the founders; and the other half at the others. If I and my wife take up two apartments (for we are to be decently asunder; however, I stipulate, and her inclination will greatly suit it, that shall be no impediment to the society, but a considerable advantage to the economic part); a third shall be for some worthy person; and to facilitate the rest I offer to furnish the whole pavilion completely to the value of £500 in goods and moveables, if need be, for seven years, till there shall be a public stock, &c. There shall be maintained at the public charge only a chaplain, well qualified; an ancient woman, to dress the meat, wash, and do all such offices; a man to buy provision, keep the garden, horses, &c.; a boy to assist him and serve within. At one meal a day, of two dishes only, unless some little extraordinary

upon particular days or occasions (then never exceeding three) of plain and wholesome meat, a small refection at night, wine, beer, sugar, spice, bread, fish, fowl, candle, soap, oats, hay, fuel, &c., at £4 per week—£200 per annum; wages £15; keeping the gardens, £20; the chaplain, £20 per annum; laid up in the treasury, £145, to be employed for books, instruments, drugs, trials, &c. The total, £400 a year, comprehending the keep of two horses for the chariot, or the saddle, and two kine—so that £200 per annum will be the utmost that the founders shall be at to maintain the whole society, consisting of nine persons (the servants included), though there should no others join capable to alleviate the expence. But if any of those who desire to be of the society be so well qualified as to support their own particulars, and allow for their proportion, it will yet much diminish the charge—and of such there cannot want some at all times, as the apartments are empty. If either of the founders thinks expedient to alter his condition, or that any thing do 'humanitus contingere,' he may resign to another, or sell to his colleague, and dispose of it as he pleases, yet so as it still continue the institution. Orders.—At six in summer, prayers in the chapel: to study till half an hour after eleven: dinner in the refectory till one: retire till four; then called to conversation (if the weather invite) abroad, else in the refectory—this never omitted but in case of sickness: prayers at seven: to bed at nine. In the winter the same, with some abatements for the hours, because the nights are tedious, and the evenings' conversation more agreeable. This in the refectory. All play interdicted, *sans* bowls, chess, &c. Every one to cultivate his own garden. One month in spring a course in the elaboratory on vegetables, &c. In the winter a month on other experiments. Every man to have a key of the elaboratory, pavilion, library, repository, &c. Weekly fast. Communion once every fortnight, or month at least. No stranger easily admitted to visit any of the society, but upon certain days weekly, and that only after dinner. Any of the society may have his commons to his apartments if he will not meet in the refectory, so it be not above twice a week. Every Thursday shall be a music meeting at conversation hours. Every person of the society shall render some public account of his studies weekly, if thought fit, and especially shall be recommended the promotion of experimental knowledge, as the principal end of the institution. There shall be a decent habit and uniform used in the college. One month in the year may be spent in London, or any of the Universities, or in a perambulation for the public benefit, &c., with what other orders shall be thought convenient."

This scheme, which is characteristic of Mr. Evelyn's mind at the particular time of occurrence, would have probably departed from its principles, as it may be thought too romantic to have stood the collision of human passions and human events. During the civil war, and under the Protectorate, he lost no property; nor was his person ever molested, though his attachment and connection with monarchy was known, and also his correspondence with the exiled party. His conduct was delicately skilful; and by his upright conduct and philosophic conciliation he retained the esteem of the opposite parties. He was well received by the restored monarch, and had several public offices conferred upon him. He was a commissioner for the rebuilding of St. Paul's, and was appointed one of the first Fellows and Council of the Royal Society. He had great credit at court, and a high reputation in the world.

His leisure time was occupied at Sayes Court, in gardening and planting, which he ever reckoned to be truly rational and delightful occupations for the mind of man. His literary labours were continued with an unremitted zeal. On the death of his elder brother without issue, he succeeded to the paternal estate of Wotton, to which place he removed in the year 1700. He let Sayes Court to Admiral Benbow, and subsequently to Peter the Great of Russia, who came to Deptford to learn the art of ship-building. The house was furnished and rented by the King of England, who treated thus hospitably the semi-savage of the frozen regions. The Czar indulged the frolics of a savage wantonness in destroying the holly-hedges of the garden, which had been reared by the care of Evelyn: he had gaps cut through the hedges in all directions, in order that he might be wheeled in a barrow drawn by labourers, in all the emptiness of childish delight. The damages done to the property were made the subject of legal inquiry, and Evelyn obtained £150 in compensation. He was at Wotton during the great storm of 1703, when above one thousand trees were blown down in sight of his house. His last visit was paid to the paternal seat in July, 1705; and the last memorandum made in his journal was of February 3, 1706.

During his latter days there was no relaxation of his endeavours to be useful. His collections were great, and he was ever ready to communicate them for the benefit of others. He furnished matter for several publications, and was an assiduous attendant of the Royal Society, and careful in his intelligence. His learned life and labours terminated on February 27, 1706, in the eighty-sixth year of his age. His body was interred at Wotton, beneath a white marble stone, with the inscription according to his own intention—"That all is vanity

which is not honest; and that there is no solid wisdom but in real piety." He had of family five sons and three daughters: the former all died young, except the third, who wrote several works, and enjoyed a considerable reputation.

Evelyn's character has always been drawn in terms of a very just panegyric, from which no account of his life has ever attempted to retract. His personal character was truly amiable. As a father, a husband, and a friend, few persons ever equalled his constancy and affection: and his correspondence, which still exists in MS., affords many proofs of a kind heart, and a placid humble temper. He was greatly beloved by all who knew him, and his acquaintance was most extensive. Titles he never appears to have courted; and it is singular that Charles II., who was not niggardly in what cost him nothing, should not have tendered the rank of baronet to a man who was one of the ornaments of his reign. He never was cordial with James; and after the revolution he may have thought the addition of a title very insignificant at his time of life. He acquiesced in, rather than approved, the revolution of 1688: he did not condemn the objects which were sought to be attained, but thought the end might have been accomplished by other means. He was acquainted with many sciences, and wrote on many different subjects, yet was far from being a superficial writer. He had genius, taste, and learning; and knew how to give all these a proper place in his works, so as never to pass as a pedant, even with such as were least in love with literature, and to be justly esteemed a polite author by those who knew it best.

There is said to be a family genius in the home of a man of genius. Evelyn conversed chiefly with trees: his father delighted in the same pursuit: his grandfather was a great planter and preserver: and his own son followed the footsteps of his father. The surname Evelyn, originally Avelan or Evelin, was filbert, or rather, hazel, which occasioned the remark that these trees are commonly produced near dry stone quarries, among the excavated rubbish. Evelyn hated iron-works, as they destroy woods; and yet his family were induced by them to make very large plantations.

The exquisitely constructed mind of Evelyn looked at every object in the superlative degree, and he fixed on gardening as a favourite point of attention. That performance is the cultivation of the earth in the highest excellence, and never fails to engage those minds that rise beyond the plodding in the mud of common routine. He published the first calendar of gardening under the name of "Kalendarium Hortense" in 1664, 8vo., to which is added his discourse on sallets. "The French Gardener," in duodecimo, had appeared in 1658, and in 1672 and 1675, and had added to it The English Vineyard vindicated." The joint work passed through numerous editions. The "Kalendar of Gardening" occupies 175 duodecimo pages, and is divided into twelve months, with instructions what to do with fruits and flowers in those periods of time. The "Terra," or a philosophical discourse of earth, relating to the culture and improvement for vegetation, was published in 1676, and formed a discourse made before the Royal Society, and published by the order of the members. It occupies 182 pages of duodecimo, and describes the pulverization of land, the action of manures, and the effects of irrigation. Clay is called "a cursed step-dame to almost all vegetation, as having few or no meatus's for the percolation of alimental showers." Laxatives are to be applied, as sand, marle, chalk, and sawdust, and constant vexing with the spade and plow; but above all, with sea-sand, and the burning of the ground to ashes—for by no less severity will this ill-natured mould be subdued. All rotten substances are good. Loam is a succulent kind of "argilla," and an excellent mean between extremes of looseness and cohesiveness. Mostly all the manures yet known are well described, and the qualities ascertained. Much stress is laid upon the salts of the earth, which was a very favourite subject with the first philosophical inquirers. Evelyn approves the resting and exposure of land, in order to acquire a generous and masculine pregnancy; but doubts Sir Hugh Plat's contrition, or philosophical grinding of earth, by which it was prepared, to produce in our country the fruits of the Indies, as well as in the native countries. The attractions from the air are supposed to impregnate the soil with all the blessings that are required. The "Terra" of Evelyn has always maintained a just and well-merited reputation.

The "Sylva" fills 120 pages of folio size, and is joined in a volume with "Pomona," or an appendix concerning fruit-trees. The discourse of forest trees is divided into descriptions of the several trees, qualities, and use; of the infirmities of trees, copses, and pruning of timber and fuel. The laws and statutes are mentioned which guard the preservation and improvement of woods, &c. This book was formed of lectures before the Royal Society, and proved of vast utility for the propagation of timber. It is thought to form the chief work of the author.

The "Pomona" occupies 20 pages, and treats wholly the fruit of the orchard, and the making of cyder.

The "Reflections on some parts of Agriculture" are merely physiological disquisitions on the functions of the various organs of plants, arranged in

twenty-two chapters. The preparation and circulation of the sap engage much attention.

Evelyn entertained his mind with the study of sculpture, architecture, painting, and the coins and medals of ancient times. He wrote strongly in favour of active employments in preference to solitude—holding the opinion that individual services are to be used for the general good, and that no action must lie dormant. During the Dutch war he acted as a commissioner in charge of the prisoners and the wounded sailors—an office which he filled with much philanthropic feeling, and the most constant and tender attention to the fellow-creatures of his charge. The plague of London had much of his attentive zeal in the relief of suffering, and in suggestions for support. In his intercourse with royalty he never failed to tell kings what should be done, and in terms void of offence. He lived under revolutions, and might have profited by the changes; but when the spoils of his country lay at his feet, his lofty soul would not stoop to gather them. He amassed neither riches nor titles, but in the everlasting memory of his countrymen he secured the richest treasure, and by far the loftiest title which human grandeur has to bestow. The name of Evelyn will ever form one of the brightest characters that adorn the page of any biography of Britain.

Evelyn styled himself a pioneer in physical knowledge, imitating Sir Hugh Plat in choosing an appellation that denotes a low place of employment, in order to reach the higher positions by means of sapping and undermining the foundations. The learned Mr. Wotton says "that it may be esteemed a small character of his 'Sylva' to say it outdoes all that ancient authors have left us on the subject, and a great deal more, as it contains more useful precepts, hints, and discoveries, than all the world had ever known before." No English author had more benefited the arts of agriculture and gardening.

A short time before his death Evelyn revised the fourth edition of the "Sylva;" and in 1776 a new publication, with many notes and explanations, was edited by Dr. Hunter, of York, which has been twice printed, along with "Terra" and "Pomona." The name of the author will always attract notice.

It has been recorded by one narrator only that Evelyn left unpublished "A Treatise on the Dignity of Man." If true, the loss is great that man has not been dignified in writing by a person who, in his whole deportment, added a lustre to the image of his species. It may be doubted if the relic existed: his son must have known it; and in conjunction with other friends of the father, would no doubt have made proper use of it.

XXXIV.—Duckett, 1659.

Thomas Duckett wrote "Proceedings concerning the improvement of all manner of land, &c." This notice is printed in Weston's Catalogue of English Authors; but no mention of an author of that name is anywhere found beyond that list.

XXXV.—Stevenson, 1661.

M. Stevenson wrote "The Twelve Moneths; or, A pleasant and profitable discourse of every action, whether of labour or recreation, proper to each particular moneth; branched into directions relating to husbandry, as plowing, sowing, gardening, planting, transplanting, plashing of fences, felling of timber, ordering of cattle and bees, and of malt, &c.; as also of recreations, as hunting, hawking, fowling, coursing, cock-fighting. To which likewise is added a necessary advice touching physick, when it may, and when not to be taken. Lastly, every moneth is shut up with an epigram. With the fairs of every moneth."

This work occupies 59 pages of small quarto size, and is a curious book—almost beyond precedent. Each month of the year is prefaced with an engraving of an appropriate device, with the name of the month written in very large old English characters. The directions are given as promised in the title-pages. The fairs are mentioned, and an epigram closes the monthly labour. A specimen is here given in the epigram at the end of March:—

"Gallants, look to't! Cupid hath got his bow,
And strung't with wanton eyes to shoot at you;
And now the spring has filled your veins with blood,
Active and fresh, he's not to be withstood:
Beware, too, how your veins you overheat,
If not for fear of lusts, for fevers yet;
And give your vig'rous spirits an allay,
With cooling drinks, and clarifièd whey.
Ceres and Bacchus, wine and dainties—these
Are those that wound ye: Venus else would freeze!"

XXXVI.—Miles, 1662.

Abraham Miles wrote "The Countryman's Friend," London, 1662, duodecimo. This book is quoted in the "Bibliotheca Britannica," but had escaped both Mr. Weston and Mr. Loudon in making a list of authors. It is found in the British Museum, and occupies 30 pages of small duodecimo. The contents are the cures of diseases which afflict countrymen who have not the means of other applications. The remedies given are simple, and in every one's power—which is the author's intention. Two remedies are given for horses, and how to keep crows away from a cornfield. The application is sulphur and turpentine, smeared on feathers, which are stuck under the ears of corn.

THE DUKE OF PORTLAND'S MEADOWS AT CLIPSTONE PARK, MANSFIELD.

About thirty years ago, his Grace the Duke of Portland commenced those extensive operations a short distance below the town, which have resulted in what are known as "The Clipstone Water Meadows." The stream is the little river Maun, which passes through Mansfield, and forms the natural outlet for all the sewage and drainage of the inhabitants. These water-meadows now contain about 400 acres, and form the most fertile tract of country, of equal extent, in the midland counties of England. But for the scientific application of the Maun streams, they would still have continued an unprofitable waste and bog. With perfect drainage of the town, and the immediate removal of all the night-soil and other organic refuse, a still higher state of fertility would be attained; or else a much larger area might be brought under the influence of the sewerage waters.

The mutual interest of town and country in the removal and application of sewerage waters is so apparent in the case of Mansfield, that I have no hesitation in saying, the inhabitants of the town would have been gainers at this moment if they had thirty years ago efficiently drained the town, and constructed economical irrigation works upon the Duke's property, for the mere privilege of disposing of what was injurious to them, without any other return than that of general improved health. So, on the other hand, his Grace the Duke of Portland would have been a gainer if he had, at his own cost, thoroughly drained all the buildings in the town of Mansfield, and provided water-closets for removing the soil, with the sole object of increasing the fertility of his agricultural land.

A large flood-dike, about four yards wide, takes the whole stream of the river, and conveys it, by contouring, a distance of 5½ miles on a perfect level. The whole area of this long channel acts as a reservoir, and there is no current except to the points where the irrigation may be going on at the time. The contents of this flood-dike are about 1,000,000 cubic feet. At the end farthest from the town, the dike has attained an altitude of 49 feet above the river, so that it commands a considerable area of ground.

The great flood-dike ceases at a field called the First Dam-side Breck Meadow, and from that point a new flood-dike commences on the other side of the Maun, and extends about a mile and a half, passing the village of Clipstone, and receiving the refuse of the houses there.

The mode of irrigation is similar to that on a higher level—by sluices and open catch-work gutters. The centre carriers are at right angles with the flood-dike and the river, and have a quick descent. They supply a great number of cross carriers, branching off on each side, so as to form figures, like what is known by the term "herring-bone." The cross carriers are level, and shed the stream over the surface from one to the next carrier successively, until it has done its work and reaches the river.

The carrying gutters at Clipstone are not cut out by vertical spits below the level of the ground, but are hollow-dished channels, two or three feet wide, upon which the grass grows almost as freely as upon the other parts of the meadows. This has two important advantages; there is no loss of producing surface, and the cost of cleaning gutters is almost saved.

I derived much information from Mr. Robert Tebbett, who has been water-bailiff to the Duke about 30 years. The irrigation was just commencing at that time. He has seen every meadow laid down except one, and has had charge of the whole ever since. He furnished Mr. Denison with information for the essay on these meadows, and believes that the figures as to the cost of the system are correct. Several additions have been made since Mr. Denison wrote, so that the whole area now would be very little short of 400 acres. The cost per acre, and also the working expenses, may be fairly taken, however, at the same proportion as in Mr. Denison's figures. Exclusive of drainage, therefore, the average cost of formation per acre is at least £120, which, taken at 7½ per cent., gives an annual charge of £9 on the capital account. Superintendence, &c., at 10s. per acre per annum, must be added, making the whole £9 10s. per acre per annum.

Besides the sewage and refuse of the town of Mansfield, and in the lower part of the village of Clipstone, a large quantity of fertilizing matter is obtained from the farm-building along its course. Mr. Tebbett says, "he keeps 3 milk cows, and the drainage of all his premises goes into the water." At the New Buildings there are 8 farming horses kept, and, on the average, 4 blood horses, 6 pigs, 26 cows or oxen in summer, and about 50 in winter. No sheep are kept. There are also two cottages with families, and a drain from the yard conveys all the liquid from the premises to the

flood-dike. There is also a drain to convey the liquid fertilizing matter from Cavendish Lodge, or Clipstone Park farm. The upper flood-dike stops nearly opposite, and this drain falls into the river Maun, serving the lower level. At the farm there are 28 horses, about 50 horned cattle, and 6 pigs. The village of Clipstone, draining into the same level, contains about 34 houses. Mr. Tebbett says the Duke gets all the wash, refuse, sewage, and liquid manure he can into the flood-dike.

There is always a small black sediment left on the surface of the ground in the upper part. In the lower it gradually changes to a brown colour. This is no doubt finely-divided manure brought in suspension, and the soil acting as a filter separates it so as to deposit a top-dressing. Mr. Tebbett considers it highly beneficial to the herbage. There is some dye-wash in the sewage of Mansfield, but it is not found at all injurious to vegetation. The working of the mills in and above the town so varies the flow, even at different parts of the same day, that I found it impossible to make any calculation as to the quantities of fluid used.

Taking into account the extent of land irrigated —the comparatively large supply of fertilizing matter from the sewerage of the town, and the auxiliary supplies taken in along the course of the flood-dike and carriers—I do not think I have seen any instance, except Edinburgh, in which so large a quantity per acre is applied.

From the great inclination of the surface the fluid passes rapidly off, and yet I have not met with anything more pleasing than the perfect manner in which it is filtered, both mechanically by the soil, and chemically by the living plants. The fact that the flood-dike and the river course run parallel to each other, with only the meadows intervening, is peculiarly favourable for observing the transmutation.

At Old Mill Lane, the end nearest the town, the flood-dike abstracts the whole stream of the Maun, so that, in forming the next two meadows, its original course was perfectly obliterated. Shortly, however, its course became necessary to convey the water after it had been used for irrigation. At the point where its channel again begins, two land drains have their outlets. Besides these the whole stream, for a distance of more than four miles, is entirely derived from the water flowing in after it has been used for irrigation.

Mr. Tebbett, speaking from recollection, informed me that all the upper portion was a wilderness covered with gorse and heather, among which a few sheep wandered. Of the lower—on the margin of the river—that it was certainly land, but that was all could be said. It was such a bog as to be utterly worthless. No animal but those of the feathered tribes could get on it: it was the haunt of wild ducks and snipes. The whole area of what is now water-meadow would have been well let at 3s. to 5s. per acre.

Of its present value and produce, such of the land as is let irrigated produces a rental of £4 10s. per acre. Mr. Tebbett says:—"We reckon to mow three times for green eating, and then turn on cattle to feed; or we may mow twice for hay and then feed. In the beginning of May we can cut eight inches of fine grass, after which we irrigate as soon as possible. In eight weeks we can cut again a similar or rather heavier crop, and again in eight weeks a third crop equal to the second. It is then fed off with either beasts or sheep, and will support three bullocks or fourteen sheep for every two acres from August to the latter end of November."

Mr. Denison gives statistics of the produce, showing the average annual value per acre to be not less than £12 4s.

Before the irrigation was commenced, the Duke of Portland's annual account for bone manure alone on the estate was about £1400 per annum. The solid manure produced on the farm, and the irrigation, are now quite sufficient to fertilize the whole, and no bones are purchased.

I have dwelt at greater length than I had intended upon the Clipstone meadows, because they are a prominent example, within a few hours' distance of almost any part of England, of the great fertilizing powers of town sewerage waters. The town is but small, the drainage of it very inadequate for the removal of the most fertilizing refuse, and the mode of application exceedingly expensive in its first cost as compared with distribution by pipage; but the results as to the enormously increased produce and value of the land are such as I have just stated.

There is a further objection to open gutter irrigation that I have not alluded to, and I have not space to go fully into the consideration. I refer to the tendency to rot among sheep pastured on meadows so irrigated. In the essay already named, Mr. Denison quotes some very valuable remarks from the Duke of Portland himself, who had personally bestowed great attention on this point. He says—"None of the irrigated meadows can be said to be quite safe for sheep in autumn, not even those which are on the land naturally most dry." He thinks it probable that more complete drainage of the land would decrease the liability to this disease, and I believe that such has been found to be the case; but when the ground is so completely saturated as it must be with the open gutter system, I do not think that any arrangements for drainage can obviate all risk. It may, however, fairly be assumed that the tendency to rot is owing in part to the land being naturally a bog.

Where the irrigation is carried on by means of pipe and hose, and the distribution by jet, the ground is never saturated, because the fertilizing fluid is so perfectly under command that the same effect can be produced by a much smaller volume of water. I have never heard of the least tendency to rot where the pipe and jet system is in use.—*Mr. W. Lees' Report to the Board of Health.*

THE AGRICULTURAL DISTRICTS OF ENGLAND.

[FROM THE TIMES' COMMISSIONER.]

WOBURN.

The estates of Earl Spencer, Mr. Lloyd, and Lord Overstone are managed by Mr. Beasley, whose farm we described in our last letter. For the last two years there has not been a farthing of arrears on the whole of these extensive estates, comprehending tenants from £1000 a-year to the humble cottager, and including 600 of the latter class. This is attributed to the farms being moderately let, and to the erection by the landlord of suitable buildings for lodging the cattle and saving their manure, and to drainage. It is not that the farms are let lower by the acre than other estates, but that they are let truly as farms, fitted by the landlord with those accommodations by which a tenant is enabled to farm successfully. This liberality of the landlord is fully appreciated by the tenantry, and gives the agent an immense advantage in the selection of tenants when a farm becomes vacant. He has the choice of the best men, and there can be no doubt that an estate can be most effectually and economically improved through good tenants. The farms are not advertised and never let by tender; they are examined by the agent, who fixes the rent and selects his tenant. In valuing a farm Mr. Beasley assumes that all adequate accommodation will be provided by the landlord. No per-centage, therefore, is charged on any outlay by the landlord, either for buildings or drainage. The land is valued at its intrinsic or natural worth, with such ameliorations as the landlord ought to make at his exclusive cost, and thus the rent of good and bad farmers is raised alike. If the bad are thereby compelled to quit, so much the better. The more common practice of valuing land as it stands, without regard to the landlord's outlays or the tenant's improvements, increases the rent of the good farmer in consequence of his own exertions, and lowers that of the negligent one as a reward for his neglect. Instances have often occurred where farms of precisely similar character and rent have been revalued, and one that had been well farmed was raised 10s. an acre, while the other, which had been badly farmed, was lowered 10s. an acre, the landlord in both cases having dealt equally by both tenants in doing nothing for either, but leaving each to follow his own plans. An abatement of 10 per cent. has been made on the estates under Mr. Beasley's management for the present year, more as a mark of sympathy on account of the deficient crop of last year than as a permanent readjustment. The time for that is not yet come.

The farms are all held from year to year, and there is no desire on the part of the tenants for leases. The security under such landlords is felt by the tenants as quite sufficient, and yet there have been many instances where a change of owner has completely altered the confidence formerly subsisting between tenant and landlord. On Earl Spencer's estate, however, good landlords are believed by the tenantry to be hereditary. Some of the farms on the estate have been held by the same family for 300 years, and the average period during which all the farms on this estate have been held by the same families exceeds 90 years. Nor is there any written agreement or other document to bind either landlord or tenant. The rent is entered in the rental, and the tenant pays it punctually as a matter of course. Crop books are kept for every farm, and the agent visits every field once a year. He interferes with the tenant's management as little as possible, and chiefly in the way of advice. On each of these estates large sums have been expended on buildings, farm-yards, and in better arranging the farms. Draining tiles are given almost without limit.

But the landlord's expenditure is not limited to the requirements of his farms—the comfort of the labourers on these estates has met with an equal share of attention. On Lord Spencer's estate, within a short period, 74 new and substantial cottages have been erected, in groups of two, three, and five, with a pump and kitchen common to five cottages, fitted up with oven, copper, ironing-board, &c. To each cottage is attached a rood of land, a pigstye, wood barn, &c. They are let by the week at a yearly rent of £3 10s., including land. The average rent of cottages on these estates is under £2. There are also many garden tenants, who have a rood of good land (in all cases near their homes), and for which they pay 10s.—the landlord paying rates. Besides building new cottages, Lord Spencer has put into order an immense number of old ones, and is still continuing to build, but on a less expensive plan.

The tenants of bad land on Sir Chas. Knightley's estate, besides getting their farms drained free of charge, have received what is equal to 20 per cent. of abatement. In the neighbourhood of Weedon, and to the south of it, two-thirds of the land is in grass of prime feeding quality; the other third is cultivated in a six-course, thus: seeds, wheat, beans, wheat, turnips, barley. There being so large a proportion of the land in grass, a heavy stock is kept on the different farms in winter on cake, and so a great quantity of manure is made, by which the arable land is kept in high condition and yields abundant crops.

Land of prime feeding quality in this part of the county is let at £2 per acre, tithe free, and the rates from 3s. to 4s. an acre. It is not uncommon to see five fat and powerful horses yoked in line in a plough, turning over a barley seed furrow not more than four inches deep. Amid such heavy complaints of distress it is wonderful to see such a heedless waste of power.

Passing from Northampton to Bedfordshire, we proceeded to the Park Farm at Woburn, the seat of the Duke of Bedford. It was certainly with no feeling of idle curiosity that we endeavoured to acquaint ourselves with the relations subsisting between the head of the house of Russell and his numerous tenantry and dependants. A nobleman of the highest rank, the owner of one of the largest landed estates in the kingdom, all situated in purely agricultural districts, and deriving no direct aid from the neighbourhood of any of our hives of manufacturing industry, and yet the possessor of a name identified with the progress of all our liberal institutions, it could not fail to be instructive to learn how this large property was administered.

The farms are never advertised or let by tender. When a farm becomes vacant it naturally forms the subject of conversation at the market table, and parties wishing to take it make application. The farm is then valued by the local agent, a practical man, who estimates it as in perfect order in so far as the landlords' improvements are concerned. Anything that is requisite to be done, either in regard to drainage, fences, or buildings, is done by the landlord as a matter of course. The Duke then selects his tenant from the various applicants, and offers the farm to him at the rent fixed by the agent. It is generally accepted at once, and by a picked man. All the tenants have the option of and are encouraged to take leases subject to fluctuations in price of corn. One half of the tenantry accepted leases of various duration—12, 16, and some 20 years. Those who prefer a fixed rent have shorter leases—7 or 8 years, and then a readjustment of rent according to prices. The rental of the estate at present is rather more than in 1834 and 1835, but a very large outlay has been made in improvements to maintain it. In some cases these improvements are equivalent to a reduction of 12 to 15 per cent. There is no system of general temporary abatements. If a complaint is made, the case is at once considered on its own merits, and, if requisite, the rent is readjusted. At the end of every lease a readjustment takes place. A farm taken in 1843 at a fixed rent then calculated, with prices at 56s. as the basis, is now being converted by adding the value of such improvements as have since been made by the proprietor, and then charging the rent on the basis of 40s. for the quarter of wheat. The corn rent is in some cases all corn, in others part corn and part money, varying with the character of the land, and the proportion in which its produce is dependent on the prices of corn. The basis for present (Spring) lettings is 40s. for the quarter of wheat, regulated afterwards by taking the average of the whole country for four years, each year taking off one year and adding another. Game is not preserved, and hedgerow timber injurious to the tenant is at once felled and removed.

A system of husbandry is prescribed to the tenantry, from which they are not permitted to deviate except by consent of the agent. On light land that system is the four-course; on strong land the same, with the substitution of beans in lieu of a portion of the clover, and such extent of dead fallow as may be necessary. On new land, much of which has been broken up in consequence of the Tithe Commutation Act, two white crops are allowed at the commencement. The land is generally breast-ploughed, turned, and sown with coleseed. This destroys wireworm. Oats are then taken, followed by wheat, then beans, then wheat. The breaking up of inferior pasture has been a great boon to the farmers, as they have had heavy crops from it at little expense, and strong land carries good green crops after first being broken up. The introduction of winter beans into the rotation has been of immense benefit to the light-land farmer, by enabling him to alter his crops. They require to be planted in September, if possible, and hence the difficulty in getting them sufficiently early into the ground in the northern counties, and consequently their greater uncertainty there.

The comfortable accommodation and welfare of the labourers is a consideration with the Duke of Bedford not less important than equitable arrangements with his tenantry. Cottages are built in numbers sufficient to suit the wants of the different farms, with a due proportion for the mechanics also necessary. The cottages are situated near the farms on which their occupants are to be engaged. They

are held directly from the Duke, from week to week, so that both the labourer and the farmer are kept in some degree of check. Thus an ill-conducted labourer can be promptly dismissed from the estate, while a trifling jealousy or pique on the part of the farmer is not necessarily acquiesced in by the landlord. All the cottages have two rooms on the ground floor, and two or three sleeping apartments up stairs. They are fitted with kitchen range and copper, and one fireplace up stairs, outbuildings for wood, ashes, and other conveniences, and an oven common to each block of cottages.

The cottages are built in a substantial manner of various designs, the situation being so chosen as if possible to combine the advantages of a genial airy exposure with a plentiful supply of water. Ornament is employed, but not further than is in accordance with the character and objects of the buildings. While needless expense is thus avoided, the cottages are substantially constructed, so that they may not be subject to frequent repair. The use of hollow brick will, it is expected, not only cheapen the cost of construction, but add materially to the dryness of the walls and to the healthy ventilation of the house. Cottages built of hollow brick, with wall 9 inches thick, cost £90 to £100 each.

Field allotments, from an eighth to a quarter of an acre, are provided close to each cottage, as in the case of villages, as near at hand as they can be conveniently had. The rent is charged at rates varying from 20s. to 40s. an acre, inclusive of rates. The rent of cottages varies from 1s. to 1s. 6d. a-week, according to accommodation, and is paid half-yearly with great regularity. It is believed to give a return of nearly 3 per cent. on the outlay, exclusive of the value of the site.

But the education of the labourers' children is not forgotten while their bodily comfort is so amply cared for. Schools are being built at the Duke's expense, in central villages, for the accommodation of two or three adjoining parishes, for the more advanced scholars; and in most parishes infant schools are established, at which the youngest children receive a little instruction in the immediate neighbourhood of their own homes. To all of these the Duke subscribes, and the children pay, so that the schools are partly self-supporting, and the independence of the parents is not compromised.

On an estate of such magnitude as that of the Duke of Bedford, where the duties as well as the rights of property are so fully recognised, there being constantly new sets of farm buildings and cottages in progress, it has been found necessary to erect a complete set of workshops for the construction of every article required on the estate. In the yard at the Park farm appropriated to this purpose 100 workmen are constantly employed, chiefly skilled mechanics, under the superintendence of a resident engineer. This is conducted with all the method of a private speculation, the workmen attending throughout the year from 6 a.m. till half-past 5, with intervals of half an hour for breakfast and one hour for dinner. The premises are lighted, when necessary, with gas, and an equal temperature is maintained by steam pipes, in the different workshops. These comprise a wood yard, with sawing sheds for cutting up into all requisite sizes either foreign or home timber, the refuse of which is split into faggots for the use of the Abbey. Next, a foundry for all manner of castings; then a smithy, then an extensive carpenter's shop, then a plumber, glazier, and painter's—several apartments. A 25-horse power steam-engine saws the wood, blows the smithy fires, gives motion to the lathes in the carpenter's shop, and to plaining and other machines, while the waste steam from the boiler dries the sawn wood in the drying shed, warms the workshops, and heats an oven where the men may cook their dinners. Every kind of work is thus done on the premises, and fitted and put together before being sent out. The windows, doors, and stairs of farm buildings and cottages, being made of certa in dimensions and of certain uniform sizes, are constructed in sets more economically and substantially than they could be by country tradesmen. During winter the different articles are prepared indoors, and in summer the carpenters and other workmen are sent to put them up where they are required. Not the least interesting department of this establishment is that where troughs of water, slabs with the Ducal crest or cypher, and other ornamental parts of architecture, are formed of concrete, possessing all the hardness and durability of stone.

Adjoining these buildings are the extensive farm premises of the Duke's home farm. Here another powerful steam engine gives motion to every variety of machinery used in working up the crop on the farm. Many interesting experiments in the feeding and management of cattle are here being carried on, the *data* and results being carefully registered for the instruction of the agricultural public and the Duke's own tenantry. Comparative trials are being made of the respective advantages of box and stall feeding, of the advantages or otherwise of feeding with corn and linseed as against oilcake, and of the effects of certain chemical applications in fixing the ammonia in the manure of the box-fed cattle. All the cattle in the feeding houses were in the primest condition, so that a spectator could form no opinion as to the merits of the different modes of feeding; but it may be remarked that the box-fed cattle were all under one roof, not exposed with an open side to the air, as is frequently the case, but in every way as warm as those in the stalls. The quality of the

dung from the box-fed cattle was said to have proved itself far superior to that from the stall-fed, but on more minutely enquiring into this we found that the dung of the stall-fed cattle had been thrown into an open yard and mixed with that of the *lean* cattle, and in this state tried against the box-fed cattle manure taken directly from the boxes. Such an experiment proves nothing, and it just shows how guardedly we must watch every particular of detail before accepting conclusions as fully proved.

The fattening cattle are being fed, one part with 5lb. of barley, beans, and linseed, and the other with 5lb. of oilcake to each animal, boiled and poured over 14lb. of cut clover hay and 45lb. of cut swedes in layers, in large boxes, which are covered up and left for 24 hours, and the mixture is then given in three feeds. The cattle get no other food, and no water. The milch cows, when they calve, receive cut hay and 1lb. of oilcake daily. On this they do extremely well till the grass is ready, better than on mangold, and swedes are never given as they taste in the milk. The year-olds receive cut hay with 1lb. of meal sprinkled over it, and 1 peck of cut swedes daily. A very fine herd of Hereford stock is kept, and a first-rate cross for quality of meat is got from an Ayrshire cow by a Hereford bull. We must not omit mention of the pig department, with its ample and unusually elegant feeding-house, and the various contrivances for cooking and conveying the food to the animals without disturbing them.

The liquid from the different cattle houses and yards is conveyed to a covered tank, over which a wooden house is erected, where ashes, night soil, wood ashes, and other dry refuse is stored, and also the solid droppings from the feeding stalls. The liquid is pumped over the ashes and the whole turned and mixed together to dry, in which state it is drilled in as manure with the turnip seed.

The farm buildings throughout the estate are many of them very extensive and new, but we cannot say that they appeared to us to be designed with that regard to economy and arrangement which would render them models for other estates. They comprise extensive barn accommodation, stables, feeding stalls, and large open yards with sheds for young cattle. A farm let at 25s. an acre, or 400 acres for £500, will cost five years' rent for all new out-buildings, including dwelling-house for the farmer. A farm at £600 will cost somewhat less in proportion, and one at £400 considerably more, so that farms of from 400 to 500 acres are found the most economical division for an estate. A set of farm buildings is at present being erected for a small farm in which the whole stock and manure are to be under cover.

We have already referred to the business-like arrangements which the Duke makes with his tenantry. The connexion subsisting between them is of an intelligent character, inasmuch as a tenant receives his farm in fitting order for the employment of his capital, neither cramped with insufficient accommodation for his stock nor wasting his means in undrained land. His crops are not destroyed by game nor injured by hedgerow timber. He has the option of a lease and a corn rent. With these advantages his rent is moderately charged, but proper opportunities are taken for a readjustment, by which the landlord receives his fair share of the increased returns, partly the result of his own expenditure, partly arising from the general progress of agriculture, the increase of population, and the accumulating wealth of the country. Tenants remain long on the estate, but a change is made without hesitation when believed to be necessary.

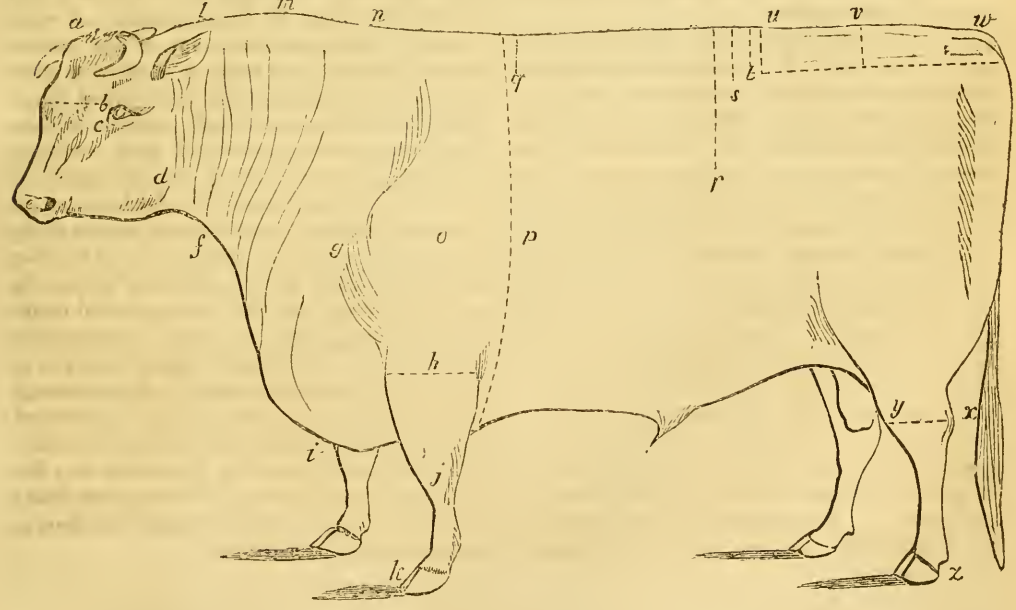
"To improve the dwellings of the labouring class, and afford them the means of greater cleanliness, health, and comfort in their own homes, to extend education, and thus raise the social and moral habits of those most valuable members of the community, are among the first duties, and ought to be among the truest pleasures, of every landlord." Such are the words of the present Duke of Bedford, and nobly is he carrying them into practice. Recognising in their fullest extent the responsibilities of his high position, he rests himself not on the possession of great wealth or the pride of ancestry, but in the performance of those duties which secure the confidence of his tenantry and engage the affectionate respect of the labourers. If we should venture to say to other landlords, "Go and do thou likewise," we may be met with the reply that they have not equal means at their disposal. Yet the same circumstances which limit or extend their property limit also or extend the claims on their justice; and great though the expenditure of the Duke may be, it is governed by that prudent foresight and adherence to economical principles which, while it provides for a fair return from the investment, at the same time draws forth the intelligent energies of those who share in the prosperity thereby created.

THE STRUCTURAL FORMATION OF VARIOUS BREEDS OF CATTLE.

(FROM THE NORTH BRITISH AGRICULTURIST.)

These are now bred in this country principally for their milk and flesh-producing qualities, and not for their power of motion as in the case of the horse. That cattle were at one time extensively bred, and used in this country for draught, there can be no doubt; but they have in almost every district given place to the horse. From the sacred records, as well as from the paintings and sculptures in the tombs of Egypt and in the discoveries of Nineveh, it is certain that cattle were used long prior to the horse as the animals of draught, both for the plough and the cart. It is not necessary here to enter into a consideration of the causes which have produced this change. Sufficient for our present purpose, is the fact that the ox is now bred in this country either for the dairy or the shambles, or for a combination of both these purposes.

The anatomical structure of an animal for the purposes of secreting milk, fat, and flesh, is necessarily somewhat different from the structure of an animal whose energy is expended on motion or draught. As yet there is little known in the animal economy of the processes of gestation, development, and progressive growth. These are in part dependent upon organs, fluids, and other agencies, among which electricity is believed to exercise a considerable influence. The mutual relations, and the peculiar definite power of the individual agencies, are, however, almost wholly unknown. Observation and experience have, indeed, given some definite information, which science has in some points confirmed. By them, the practical man has been taught that certain peculiarities of structure are connected with certain results, and his knowledge of these regulates his method of breeding, rearing, and feeding animals. The somewhat wedged-shape cow indicates a high power of secreting the lactic fluid, while the parellelogram-shaped animal, that of secreting fat and flesh. Indications such as these, even apart from any scientific explanation, are now every day made practically useful, and in the following article we will point out as many of these indications as popular opinion, or the judgment of the best breeders confirms, occasionally introducing explanations which go to establish the popular belief.



SHORT-HORNED BULL.

The first breed we will consider is the Short-horn, which stands confessedly first, as an early maturing and flesh-producing animal. As most of our readers are aware, the Short-horn is a cross, and not a pure bred animal, as the West High-

lander. It is principally to Charles Collins that the Short-horns owe their fame; he having introduced the Galloway blood with a red heifer, which was employed to give greater compactness of form to the then known Teeswater or Short-horn, and the descendants of this galloway heifer were in a short time duly appreciated, and became the improvers of Collings' most celebrated stock. One cow, Lady, at fourteen years old, sold for 206 guineas, and her daughter Countess, nine years old, for 400 guineas. Comet, a bull, sold for 1000 guineas. Mr. Collings' stock of forty-seven in number, realized £7115.

We will first consider the distinguishing qualities of the male; and we again wish strongly to impress upon our readers the indispensable importance of the muscular power being fully developed in the male of the ox, as well as of the horse. However apparently perfect in form the male is, if he shows somewhat the points of an ox, he should be rejected, as vigour of constitution and muscularity of form are always conjoined. It is a fact worthy of the serious consideration of all breeders of high bred stock, that there has scarcely ever been a Short-horn breeder who has been equally successful as a breeder of males and a breeder of females; and that the successful bulls at Exhibitions are generally of a different blood from those animals which are successful as prize takers in the classes of cows and heifers. There is another fact connected with breeding, that few breeders long maintain their position, there being some causes, not well understood in operation, against a high state of excellence being long perpetuated, and that the introduction of new blood into a herd appears always to have a most marked influence on the conformation of the produce.

There has been much controversy on the question of breeding *in-and-in*. The necessity for the introduction of new blood, *well selected, from a good stock*, is, we think, now pretty fully established. It is somewhat remarkable, that many of the most vigorous animals which have perpetuated their distinguishing points on their progeny, and stamped their general appearance so that good observers at once recognise the descent, had not full pedigrees. We give as a striking illustration, Sir Thomas Fairfax. The pedigree of the dam of this celebrated bull was defective. There are almost always to be observed in a well selected stock, distinguishing features, so that judges can at once determine from what blood they are descended. Hence the almost total impossibility of the judges at an exhibition, with the proper amount of knowledge, not making shrewd guesses at the blood of the stock exhibited, even although the pedigrees are withheld, and though they may have never seen the individual animals previously. Hence, it requires no inconsiderable amount of judgment to combine and compare the qualities of the different animals exhibited, and to free the mind as much as possible, from predilection for animals of a particular blood. This renders the office of a judge of Short-horns an extremely onerous one, and therefore their awards ought always to be leniently animadverted on.

In giving a description of the points which should distingiush the structural formation of the Short-horn, we will take the aged bull, namely, three, or above three years old, giving the appearance when viewed in different positions.

Viewed from behind, there should be a breadth of carcass, a levelness and squareness above, and along the quarters and back. The ribs should appear to be in nearly a straight line with the shoulders and hind quarters; the thighs or *twist* should descend in nearly a straight line; the muscles of the thighs should be fully developed in the inside, the thighs being united to one another well down towards the hocks. The hocks should be broadly formed, straight and large, and the legs straight and delicately formed beneath the hock. The whole appearance should give a general symmetry to the frame of the animal.

Viewed sideways, the animal should appear moderately long, height and size corresponding. The head should be rather low set, upon a strong, broad, deep, and muscular neck. The head long, and tapering towards the muzzle, the forehead broad between the eyes, line *b*, with the bones for the sockets raised, giving a concave appearance between the eyes. The eye should be large, lustrous, and prominent, pressed outward, with the fatty bed below. This is, in all animals, a certain index of facility of secreting fat. The skin around the eye and muzzle should of a delicate orange tinge; the nostrils wide; the jaws moderately clean; the ears long, well set, near the crown of the head, and covered with silky hair in the inside. The horn should be short, not too thick, somewhat smooth, rather pointed, and the colour white or slightly tinged with brown, corresponding to the colour of the skin. The throat should be clean with the skin loose down towards the brisket. The muscles along the neck should be raised and strongly developed. If so, the muscles along the back, loins, and down the whole extremities will almost invariably be correspondingly developed. The shoulder blades should be short, covered with muscles, the top of the shoulders broad; and there should be little or no perceptible hollow or depression behind them. This point is very often faulty in the Short-horn. The ribs should be well arched from the spine, and appear to be wide apart from

one another. Towards the hookbone the bony frame should be wide, and the parts well clothed with flesh, and straight along to the top of the setting on of the tail. Across the loins there should be an indentation over the spine, the hookbones moderately developed, and the space marked between the last rib and the hookbone should be short. Behind the hookbone and towards the tail (the quarters), the muscles should be well raised, embedded in fatty cellular texture, and thus feel soft, and elastic to the touch. The breadth between the hooks, line *t*, should correspond to the length between the points of the hook and the point of the fat and fleshy rump *t*, towards rump. In a full sized bull this will be about 2 ft. 2 in. to 2 ft. 6 in. The tail should be gracefully set on, small towards the point, and somewhat long. The chest should be deep, wide, and circular; the ribs forming a circular cone. The brisket should descend towards the knees, and protuberate before the forelegs. The skin of the brisket loose and flexible. The forelegs should be broad and muscular above the knee, line *h*. Before the point of the shoulder *g*, there should be a deposit of fat palpable to the feel. The shoulder blades should feel to the touch as if covered with soft cellular muscles. Over the ribs the same soft elastic touch should be felt. One of the chief points of excellence in the male is, that there should be nowhere any patches of flesh or fat, but that the whole frame should be evenly clothed with flesh, presenting to the touch a soft oily feel beneath the skin. The skin should be elastic, soft, pliable, and velvety to the touch, not too thin. When touched the resistance should be so delicate as to give pleasure to a sensitive hand, yielding to the fingers. It should feel loose along the ribs, and particularly on the neck, shoulder-blades, &c. The hair is also of the greatest importance—it should be close, mossy, and furry. Single hairs should present to the eye not the ordinary straight line of hairs, but something of the curl of long wool, without being absolutely curled. The waving of the coat should also be delicately marked. The length of hair is dependent upon the season, condition, and the manner in which the animal has been housed.

Colour we do not deem of great importance, provided it is not black, or has not a black or blue tinge. There have been more prizes awarded to white animals, than to those of any other colour; but fashion is now strongly in favour of roans, more particularly dark red roans. Those having hair somewhat evenly mixed, with one or two small patches of white about the flanks and sides, are preferred. Some object to those coloured red and white, when the patches of red or white are large. A still better grounded objection is to those having small indistinct spots of mixed hair about the size of a shilling to half-a-crown, along both sides of the spine. These are generally understood not to be kindly feeders. But colours of deep red, dark roan, or delicate roan, strawberry-spotted, cream colour, or white, are all good. White is regarded by many, as an indication of delicacy of constitution: the very opposite we believe to be the fact. If a white colour is an index of delicacy of constitution, how is it to be explained that animals exposed to cold, such as in the arctic regions, are generally white; and what is equally remarkable, that in the interior of Africa the domesticated ox is generally white, while the sheep are almost always spotted with brown or black spots? Clapperton states, that he saw herds of cattle, equal in appearance to the best he had ever seen in this country; and, in one kingdom he passed through, butter equal to the finest Chesshire. He also mentions a most formidable breed of wild cattle of a red colour. Colour, therefore, we do not consider of great importance. More is dependent on the symmetry of form; and, when the several parts of the animal combine to form a symmetrical harmony, the Short-horn surpases all the other domesticated cattle in beauty.

Viewed in front, the animal should present the same level appearance, with brisket deep and well forward. The point behind the shoulder can be here well observed, and there should be little or no falling off on this point. The feet should be circular, with the hoof strong and upright. Good hoofs are of great importance for cattle travelling. The animal, when walking, should have a somewhat gay, elastic step.

Before determining which is the best animal, both sides should be examined, as it is not uncommon, in some breeds, particularly the highly pampered Short-horn, to find one side more delicate to the touch and better clothed with fat than the other side. We have heard various reasons assigned for this somewhat strange anomaly. The most common is, that if the animal gets the habit of lying always on one side, that side will be more clothed with fat. We believe, however, that it is chiefly owing to a defect in the structural formation, possibly in the nervous system. But whatever is the cause, we look upon it as a very serious objection in all animals for breeding.

The following is a scale of points in the bull:—

1. Pedigree on the female side.
2. Pedigree on the male side.
3. Eye large, clear, and prominent.
4. Muscles of the neck full arched, but without being coarse or heavy.
5. Chest deep and circular.
6. Barrel well arched from the point of the short ribs; circular, and rather light at the flank.

7. Touch—skin soft, velvety, and moderately thin, yielding to the touch.

8. Hair thick, soft, silky to the touch and twisted.

9. Back straight from point of the shoulders to the setting on of the tail.

10. Point behind the shoulder *g*, full and level with the shoulder.

11. The whole surface of the bony structure of the body evenly clothed with cellular muscle and fat.

12. Hooks broad, level, and well clothed with muscles and fat.

13. Head fine and tapering; cheek moderately clothed with flesh.

14. Forehead broad and concave.

15. Muzzle fine; colour, orange tint.

16. Throat clean, with the skin loose down towards the brisket.

17. Brisket full, well forward, and deep.

18. The shoulders not coarse, but clothed with soft cellular flesh.

19. Hocks large and clean, with flesh descending down near to the joint—legs below the hock, clean and delicately formed.

20. Well-ribbed home.

21. Legs somewhat short and squarely placed.

22. Forelegs above the knee-joint broad, with swelling muscles, and fine below the knees.

23. Colour distinct, rich without a shade of blue or black.

24. Horns moderate in size, not thick at the roots, soft-looking, grisky, *i e*, not polished looking.

25. Hoofs round, and moderate in size.

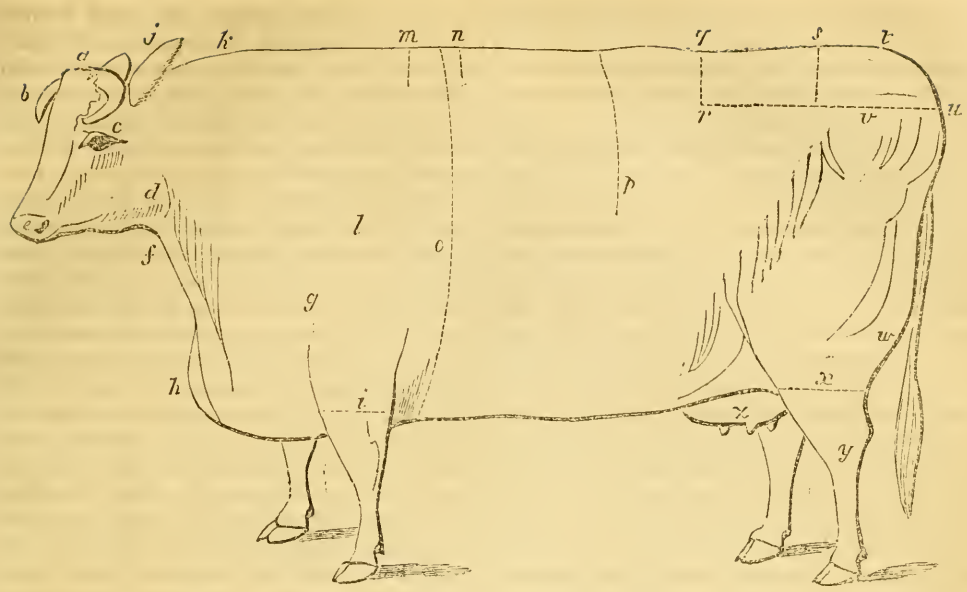
26. General appearance gay, and docile looking.

There may be difference of opinion as to the arranging of the different points, especially what may be considered the minor ones. Perhaps pedigree should not have been placed among the points, as the committees usually appointed to arrange the stock previous to exhibition, generally withhold the pedigrees, with the view of guarding, as far as it is practicable, against the judges being influenced by predilections for stock of a particular blood. Almost no animal which has not a fair pedigree has any chance in a show-yard with an animal of good blood, provided the judges are well acquainted with the Short-horn.

THE SHORT-HORNED COW.

The cow and heifer should present a somewhat different form from that of the bull, being more feminine and less robust in the development of the joints and muscles. In the females of all animals, there is a greater tendency to deposit fatty matter between the muscles, and also more immediately under the skin—this gives a greater roundness and compactness of form. The pelvis and hind quarters should be more fully developed than in the male, and the point called the stifle joint should be more out to allow room for the development of the fœtus. The cow, unlike the bull, should stand rather higher behind than before; and should also present a more rounded and broader appearance, particularly behind the chest, than the bull. It is important to observe the cow is properly formed here, as there is no other animal, with the exception perhaps of the human species, with which there are more casualties during the progress of gestation and parturition; abortion being the most common, and the most serious of all the accidents, that animal is subject to, as a breeding animal.

The power of secreting milk and also of laying on fat and flesh, is dependant, to a considerable degree, on the development of the vascular system, and the common way of examining a milk cow by feeling what is termed the milk veins, viz., those which pass along the belly before the udder, is a certain sign of this. The udder should be handsome, large, well formed on the belly; the teats evenly placed, and moderate in size; but as the property of giving milk is not one for which the Short-horn is esteemed, the udder should not be overlarge, as it requires to be in the Ayrshire, or other dairy breeds. The tail should be rather longer than in the male, and tapering towards the point. The eye should be large, soft, and expressive of docility. The head should be fine, tapering towards the muzzle, and the neck should be less muscular than in the male. The horn smaller and more turned in or upward than in the bull. The cow should present a more deep, rounded, and punchy form than the male. The parts termed points should be more distinctly marked than in the male. The point of the hook bone should be raised, and present to the eye an openness in the bony structure. On each side of the tail, flank, point before the shoulder, there should be deposits of fatty matter, corresponding to the state of condition in which the animal is at the time. Also the fat on the short ribs, and along the back, should be somewhat less uniform and more in patches than in the male. This grand distinction, which we have already alluded to, of the fat in the female being more on the surface than in the male, is apparently not well understood by judges, as it is not uncommon to see a cow placed first, with some of the points which should distinguish the male; and, again, the bull well forward in the list with some of the points which should characterise the cow or the stot. Another distinction we deem of the greatest importance, namely, that the bull should have all the masculineness which belongs to his sex, while the cow and heifer should have all the femininenes of the female, and none of the peculiar or masculine appearance of the bull.



The above outline of a three year old Short-horn cow gives a fair representation of one made up for exhibition. The points are marked nearly the same as in the bull. The point *p* is one of greater importance in the cow and heifer than in the bull. The distance between the hooks *r*, *q*, should correspond to the distance *r*, *u*—this will vary from 2 feet to 2 feet 8 inches. The breadth between the forelegs with the swelling out of the brisket are fully brought out in the cut—this, with the depth, width, and roominess of the hind-quarters, is essential with perfection of the cow.

The condition as to fat in which the animals more particularly in the classes for aged bulls and for cows of the Short-horn breed are now exhibited, has often been a subject of grave discussion. It has been strongly affirmed that over-feeding destroys the future usefulness of the animals exhibited. Others assert that it is necessary to feed the animals to show their points, maintaining that it is impossible to judge an animal till the points are brought out by feeding; while others hold that there is no difficulty in judging correctly if allowance is made for condition. We believe the latter assertion to be correct, but it requires both a nice eye and considerable experience to judge what effect condition has upon an animal comparatively lean contrasted with one fat. And the committee for superintending agricultural exhibitions, should appoint some of their number to inspect the animals exhibited, and set aside those over fed rather than leave the onerous duty to the judges. The only time we believe the judges set aside a bull, was at the meeting of the Highland Society at Berwick, when £100 prize was awarded to an animal which was considered by many inferior to the animal which was set aside. Since that time we have seen as fat animals obtaining first premiums. This subject is beset with great difficulties, but some decisive measures should be taken by the leading agricultural societies to check this most serious evil.

Since the above was written, we see that great complaints have been made as to the state of obesity in which the animals of almost all classes were brought forward at the Royal English Agricultural Society's Meeting at Lewes. The complaints refer most particularly to the Herefords, as given by us from the Report of *The Times*. There can be no boubt, that a strong, and perhaps the strongest objection to exhibitions in general, is that more valuable animals have been rendered unfit for breeding by making them up for the show-yard than by any other cause whatever. Over fattening appears more hurtful to the female than to the male, except the latter is above three years old.

The state of plethora into which both male and female are put appears also to exercise a pernicious influence over the progeny. The healthful vigour of the animal becomes impaired when in a state of obesity. Besides, they often do not produce at all—the cow usually aborting, This probably arises in part from the liver being diseased from over-feeding, as well as the constitution of the animal being otherwise injured.

The Short-horns as milk-secreting animals, are often seriously injured by over-feeding, and at present they stand in the scale as dairy stock. We

are of opinion, however, that if the same attention had been bestowed by breeders in developing their powers of secreting milk, as has been done in studying their flesh and fat-producing properties, they could have taken a high position as cows for the pail, and still maintained their position as flesh-producing animals. The condition in which animals of this breed are generally kept, destroys their milk-secreting powers. The constitution of a heifer, or cow of any breed, appears to be always more or leas injured for the dairy by over-feeding; this is known to most practical men. We have seen several Short-horns, and one Devon cow, equal, if not surpass, the best Ayrshires, both for quantity and quality of milk.

A very valuable cow or heifer for breeding should be kept in ordinary condition. If, however, prepared for the show-yard by fattening, she should be afterwards reduced by exercise, or, still better, working; but even with the greatest care, there is almost a certainty she will be injured for breeding, and except for the purpose of obtaining a character for the stock, the breeders of Short-horns will always find it to be their interest to avoid exhibitions.

In determining, therefore, which animal should be placed first in the classes of cows and heifers, the future value of the animal as a breeder should be taken into account. It should be judged of as a breeding animal, and not as an animal for the shambles.

The same remarks apply to bulls, as well as to cows and heifers.

In judging of young animals of both sexes, it is important to keep steadily in view the distinguishing quality of the Short-horn, namely *early maturity*. In this point they excel all other breeds, and in crossing impart this valuable property, less or more, to the offspring.

There are few joint diseases or malformations that require to be taken into account in judging cattle. There is, however, one—phthisis (consumption)—that cannot be too strictly guarded against. From some causes which we have never seen well explained, there is a tendency in some of the very highest bred animals to a delicacy of constitution, ending in disease of the lungs. Occasionally, too, the Short-horn is affected with diseased joints, particularly the knee and hock joints. Diseased joints will be more palpable to observation than weakness of the organs of respiration. The state of the coat, if staring and unthriving, the appearance of the eye; these, if accompanied with a cough more or less hard, or want of muscularity of form, should put judges on their guard as to the danger of phthisis. It is important to keep steadily in view that a high state of health is more essential in a procreating animal, than symmetry of form; both should be combined; but without the former the latter is comparatively valueless. The influence of either parent on the progeny is greatly dependant upon the degree of mental and bodily vigour, constitutionally, as well as at the time of procreation.

The following are the points of perfection arranged in the order we consider the most essential. In the cow we reverse the order of the pedigree with that of the bull, placing the pedigree of the bull first, as we think we are justified, from close and studied observation, in believing that the produce of the female partakes more of the qualities of her sire than of the female, or the sire or dam of the male; that is, the produce of a female will be more like the sire of that female, than either the dam or sire of the male, or the parents themselves. Even, independently of this, the influence of the dam on the character of the progeny we hold to be greater than that of the sire; this being, however, subject to certain influences, upon which we cannot enter at present.

1. Pedigree on male side.
2. Pedigree on the female side.
3. Eye full, placid, and intelligent looking.
4. Head fine, tapering towards the muzzle; nostrils large, with the orange tint round the muzzle and eyes, and in the inside of the ears.
5. Touch soft, elastic, yielding to the touch as if the skin covered a fatty fluid between the muscles and skin.
6. Chest deep, well arched, and circular.
7. Hooks broad, raised, and open-looking at the points.
8. Quarters long, wide, and fully developed down towards the stifle and hock joints.
9. Neck well set, straight, somewhat long, fine, without any appearance of coarseness.
10. Cheek small and clean.
11. Throat clean and well developed.
12. The points of the bone projections more or less covered with fatty matter, corresponding to the state of the condition of the animal.
13. Back broad, straight from the top of the neck to the setting on of the tail, and the tail at right angles to the back.
14. Shoulders short, light, and clothed with muscles and fat, the shoulders widely set at the points.
15. Point *n* behind the shoulders full, and in line with the shoulders and back. If so, the whole back will be correspondingly clothed with flesh.
16. Barrel hooped, arched and moderately deep in the cow, rather light in the heifer.
17. Well-ribbed home, space moderate between the last rib and hock.

18. Hair thick, furry, fine and silky.

19. Udder, in the cow, moderate in size. In a line with the belly, and well up behind. Teats medium size and properly placed. In the heifer the udder loose behind, and developed before, corresponding to condition.

20. Legs squarely placed, with full knee and hock joints broad and muscular above, and moderately broad below the hocks and knees.

21. Horns smooth, not too thick at the base, white or tipped with light brown, corresponding to colour of the skin.

22. Ears moderately long, oval shaped, clothed with silky hair in the inside.

23. Colour rich, dark or light roan, white and red, or white. Dark small spots on a white skin is particularly objectionable, especially when the hair is white and the spots dark.

24. Tail well set on, thin towards the point, long, down to near the hock joints.

25. Feet sound, moderate in size, and round in shape.

26. General appearance lively, gay, docile and *stylish* looking.

27. Growth moderate. In young animals if over-large, there will be a tendency to coarseness.

We have endeavoured to be as distinct and minute as space would permit in the description of the properties of the Short-horns. Those who, with the aid of the cuts, may find difficulty in fully understanding the description given, would be greatly assisted by going over the points with a live animal, even of any breed—if a high bred Short-horn, of course more of the points will be observed.

THE AYRSHIRE BREED.

The milk-producing breeds of cattle are more widely diffused than the flesh-producing ones. Much of the soil in this country is naturally so inferior, or is kept in such poor candition, that the herbage is inadequate to sustain, profitably, the fat-secreting breeds; hence those breeds which yield a return in the form of butter and cheese, are prefered to those which require richer pastures. Among the many valuable breeds for the dairy, the Ayrshire takes a prominent place; and, as a milk-producing breed, is inferior only to the Alderney. By some it is considered equal—by most dairy farmers in Scotland even superior. When the butyraceous deposit is stopped by the cows becoming dry, they are easily fattened. Oxen of the Ayrshire breed, when well fed in youth, grow to good weights at 2½ to 3 years old. If crossed with the Short-horn, they are valuable animals for the grazier. The Ayrshire breed, for these qualities, is therefore more widely spread over the country than any other.

The origin of this valuable breed cannot now be traced. It would appear to be the result of a cross of the West Highland with some less hardy breed. This breed has, we believe, within these few years, slightly deteriorated, having become more delicate in constitution. This is not willingly admitted by breeders, but we think there is no doubt of the fact. Probably this delicacy of constitution can be traced to the change of form produced by breeding *in*-and-*in*, as many of the most esteemed herds have a close affinity with one another, and many breeders never introduce a change into their stock. The breeding of them simply for their milk-secreting qualities has produced a smaller animal, with a somewhat contracted chest, and enlarged pelvis. The bull is selected, more from being the calf of a good milker than from symmetry of form, or pedigree—indeed, the last appears to be little regarded. The quey calves of the best milkers are also reared to supply the place of their dams, hence the milk-secreting powers are propagated more by hereditary qualities, than either by selection of animals from particular herds, or the selecting of animals of a peculiar formation. There are, however, certain forms indicative of certain qualities, which are so far a guide in judging of such milk-producing breeds as the Ayrshire; and these should be more carefully studied by breeders in general.

Lately a gentleman named François Guenon, a Frenchman, professed to have found by close observation that certain distinguishing marks were unfailing signs of quantity, quality of milk, and the period a cow would retain her milk-giving qualities after calving. The subject was taken up by several agricultural societies in France, and opinions pronounced highly favourable to the theory. We cannot, without a series of cuts, explain the distinguishing marks; but they are such as are commonly observed by those who come in close contact with dairy stock. We have seen both keepers of cows, as well as dairymaids, point out nearly the same signs which M. Guenon has done, in judging the milk-giving qualities of an animal with which they were not familiar.

We will, in proceeding to describe the most prominent features of the best kind of cattle for producing milk, confine ourselves to the Ayrshire, as these are the only breed in Scotland that are reared principally for their power of secreting the lactic fluid. The particular points in the structural formation can be understood by those having a knowledge of stock, without giving cuts. To those who do not understand stock, we refer them to the cuts previously given in describing the Short-horns.

The head of both male and female should be small, rather long, and tapering towards the muzzle, which should be *darker* than the colour of the skin, the eye large, lively, but not too prominent. In both bull and cow the jaw bone should be strong, and open behind, to admit of the throat being fully developed, where it passes from the head into the neck. The horns should be small, clean, crooked, and placed at considerable distance from one another at the setting on. The ears rather large, and orange tipped in the inside. The neck long, slender, tapering towards the head, and having the appearance of hollowness; the skin and throat loosely attached to the lower part of the neck. The point of the wither or shoulder should be thin. The shoulder blades should be close above, with a very slight covering of muscle. They should be developed outwards to the point of the shoulders, and should appear to the eye as detached from the structure of the chest. The chest, four quarters, and neck should be light. The hind quarters large, and somewhat heavy. The back should be straight, gradually widening from the point of the shoulders towards the hook bones. These should be wide, raised at the points, and presenting a somewhat scraggy look. The ribs towards the pelvis should be wide and circular. These, with the joints, should appear open. The carcass should gradually deepen towards the hind quarters, and these should be deep. The length of quarters should exceed the breadth between the hocks. Dairy stock can scarcely be too long in the quarters. The quarters with the pelvis should be roomy—the buttocks should be square, and somewhat fleshy—the distance between the top of the tail and the hock joints should be extreme. The hock joints should be broad, as well as the legs above and beneath these joints. The fore and hind legs should be short, somewhat delicately formed at the joints as well as at the fetlock, and the animal should appear short-legged. The feet should be round, somewhat large, and strong. The tail should be set on rather at a curve, than at right angles. It should be long, tapering towards the point, and the quantity of hair at the point should be moderate. The form of the milk vessel is of paramount importance. It can scarcely be too capacious; it should be placed well forward on the belly, and appear behind the line of the thighs. It should have a somewhat square form, but not low, heavy, nor loose, nor fleshy. The colour of the udder is by some also deemed of great importance. It should be rather white than brown, except the colour of the skin be wholly brown or black. The milk veins should be large and prominent, the teats should be placed wide apart, rather small and pointing outwards. Next in importance to the form of the udder is the touch. The skin should be thin, having the soft feel of a fine kid glove. The hair should be soft, and somewhat woolly. The colour should be distinct; dark red, or approaching to black, are both fashionable. The colours, if two, should be arranged in blots or small patches; light fawns are not uncommon, but are not deemed hardy; some are beautifully spotted with red on a white ground. The very light colours approaching to white are objectionable. A dash of the Alderney, as well as of the West Highlander, can sometimes be discerned, particularly in the colour of the best Ayrshires; but the breed as a whole, presents a characteristic distinctness of colours as well as of form. The form wants that symmetry which distinguishes the Short-horn, being more lengthy and less proportional. They are, as a breed, constitutionally much more restless and excitable than the Short-horn, approaching more to the West Highlander. The eye, although lively, should be expressive of quietness and placidity of temper; an irritability of temper being a not uncommon defect in the Ayrshire; the bulls in some districts becoming dangerous. This defect is believed by some to be confined to particular localities, and connected in some degree with the soil. The animal, when walking, should have a gay and somewhat jaunty appearance, and present all the signs of a healthy constitution. This latter point has been too much overlooked in judging of Ayrshire stock. The animals are what is termed drawn too fine; hence, the great tendency to chest diseases in this breed.

It is perhaps unnecessary to arrange the different points as we did in the case of the short-horns. Pedigree is, as we previously stated, little attended to in this breed. The bull, if in fair condition, should have an equal covering of fatty flesh all over the body, every part of it being clothed as it were with flesh. The skin soft, with the hair silky to the touch; and although he should be less feminine in appearance than a cow, he should not be too masculine looking. The muscles of both sexes, particularly the female, should be somewhat slender. These will be best observed along the neck.

The young of both sexes should be judged of in the same manner as the matured animals. In the heifer, the udder should be somewhat prominently developed; the skin of it being loose behind, and showing a capability of stretching.

The system followed in rearing Ayrshires is rather to stint them in growth when young, pinching them in food, and exposing them to inclement weather. They are, therefore, small in size, and the skin, from the old hair remaining till a late period of the season, has generally a furry, mossy appearance up till the middle of summer.

In judging of dairy stock, the first point is unquestionably the form of the udder; the second, the touch; the third, the upper pointing of the hooks; the fourth the length of quarters; the fifth, roominess of the pelvis; the sixth, arching of the short ribs. The eye, size of jaw-bone, the form of neck, colour, &c., following the other points in somewhat the same order as in the Short-horn. The medium size is usually preferred. The breed, as a whole, is dimished in size from the system of rearing to which we have previously alluded. Full feeding the stock when young is known to injure their milk-secreting qualities, and is therefore generally carefully avoided.

THE WEST HIGHLAND CATTLE.

The West Highland breed of cattle are particularly adapted for inferior and for mountain pastures being hardy, bold, and, when they arrive at maturity, possessing great aptitude to fatten on pastures which would not maintain the less hardy breeds even in ordinary condition. They possess other properties of equal importance. The beef is laid on almost entirely on the back, and the quality of the flesh is superior to that of any other breed, from the fat being distributed in an uncommonly equal manner among and in the body of the muscles. The beef presents to the eye a beautiful marbled mixture. This mixing of the fat with the lean enhances the value of the beef in the butcher market. Besides, the flesh of the West Highland ox has a peculiar aroma, which makes it as superior to the flesh of the common ox, as the mutton of the black-faced is to that of the white-faced sheep.

As objects of beauty, West Highland cattle are superior to every other animal; young horses alone excepted. Seen near or in the distance, whether in natural wood or on mountain sides, or confined in parks surrounding gentlemen's seats, the West Highlander presents a much more picturesque appearance than deer, either domesticated or wild; and we have often wondered why gentlemen who study the picturesque, do not always keep a herd of these in their policies.

West Highland cattle are naturally of a wild and irritable disposition; disliking confinement, particularly when young. They are restless, easily excited, and generally cruel to one another if crowded together. Still they are more eminently gregarious than any other breed of cattle. When kept alone, they fret, pine, and usually make little progress in fattening.

As dairy stock they are not much cultivated. The milk is rich in quality, but the quantity is seldom great, and they are not considered as keeping long in a full bloom of milk, becoming dry sooner than the common dairy breeds. They are generally allowed to suckle their offspring, which office they perform with the greatest paternal anxiety, and thus their powers as dairy stock are little attended to, and in all probability impaired. West Highland cattle are reared where even other hardy breeds would in time degenerate or die out, and they will thrive and fatten on pastures unsuited for other stock, either sheep or cattle. The demand for wool and mutton is, however, gradually restricting the walks of the West Highlander.

When crossed with the Short-horn, the progeny acquire the early aptitude to fatten of that breed, at the same time maintaining much of the beautiful symmetry of form of the West Highlander. The cross is a most valuable animal for the grazier and the flesher. Perhaps no two breeds are more alike in structural formation than the West Highland and the Short-horn. Making allowance for size, condition, and colour, the former will often, upon comparison, maintain his ground as a perfect specimen of the ox; and what are deemed the most important points in the one breed are also deemed the important ones in the other. This similarity between the two breeds is the more worthy of notice as the West Highlander appears to stand apart from other breeds of domesticated cattle. We have occasionally endeavoured to trace the relationship of different breeds to the West Highlander, but without much success, with the exception of the best bred Ayrshires, and the wild cattle kept at Chillingham in Northumberland, and at Hamilton. We have been alike unsuccessful in our endeavours to trace him to any other breed in Europe or Africa. The period of the introduction of the West Highlander into Britain, and by what race of men introduced, and where they originally came from—possibly by a race prior to the Celtic—will probably ever remain a mystery. Connecting races of men with their breeds of domesticated animals, has been somewhat overlooked in ethnological investigations.

With this introduction we will proceed to give a short description of the structural formation of West Highland cattle.

The head of the bull should be long, somewhat large, with the bony outline, particularly the jaw, well developed; the forehead broad, thickly set with hair at the top; the eye large, prominent, and lustrous; the muzzle moderate in size, nostrils expansive. The setting on of the horns should be wide apart, the horns forming a prominent point in judging of the breed. The horns should branch outwards and upwards, be moderately fine at the root, and have a *growthy* appearance. The head should be set higher than the point of the shoulders; the muscles of the neck, back, and loins, full and prominently developed; the body straight, long, with

the ribs arched, giving to the body somewhat the appearance of a trunk of a tree. The quarters can scarcely be too long. The breadth of hooks should be moderate; the chest deep, well forward, with the dewlap pendulous, hanging down to the knee joint. The joints should be large, the hock-joint in appearance disproportionately so, with the flesh of the thighs developed near the joint: the legs should be short, feet large, round, and firmly knit to the fetlock joints. The skin should be rather thick, but soft and elastic to the touch; when pressed upon by the hand, yielding and feeling smooth and elastic. The hair is most important: it cannot be too thick. It should have a downy, woolly appearance and feel, and some of the hairs rising out of the pile, the coat having a furry, shaggy look. The animal has to brave storms, in which the less hardy breeds would perish; the skin must therefore be thick, but the hair is that which principally protects the animal from the effects of wet and cold.

The most common colour is black, without one spot of white. Any white spots show a want of purity of blood. Duns, light and dark, are not uncommon, but are not esteemed. Light yellows and fawn colours are also considered objectionable. Cream colour, dark sandy yellow, and reds, are all good, besides being extremely beautiful colours. Variety of colours in a drove of Highland cattle adds considerably to their appearance as a lot, and we believe, more or less enhances their market value.

In going over the points of the bull, we have described nearly all the essential points in the cow. To add to the roominess of the pelvis, the hooks should be broader and more open looking than in the bull, the hind quarters long and somewhat widely set, particularly at the stifle joints. Owing to the broad structural formation of the West Highland ox, with the somewhat large and bony head, the cow is peculiarly liable to accidents during parturition. The cow, therefore, should be roomy in the pelvis, and slightly elevated behind. The horns cannot be too fine at the base, if proportional with the long outward and upward spreading of the horns. The eye should be less prominently placed than in the male, but should be larger, clear, and somewhat fiery in expression. The udder is often extremely handsome in the Highland cow; but when exhibited at shows, they are generally dry, being exhibited as breeding animals, and not as dairy stock.

The young of both sexes are generally small, except they are well kept when young, particularly during winter. In judging of them, the touch, hair, size of the hock-joints, with the form and appearance of the horn, are all indications of what they will become with a course of feeding. The size of chest, muscular development, &c., are also not to be disregarded.

In a show-yard the West Highlander is not seen to advantage. Disliking confinement, he is generally sulky and stubborn. Seen at liberty, his movements are extremely graceful. He walks with a firm, elastic step, and looks what he is—a bold, majestic, and determined animal.

It is to be regretted that little or no attention has been bestowed, in breeding the West Highlander, to develope more prominently early maturity, with a greater placidity of temper. He comes only to perfection at four or five years' old, and from temper is unsuited for feeding in curtains. If he could be reared to fatten in confinement, at two and a-half or three years old, to the weight of from 50 to 60 stones, and the beef to be of equal quality to what it is at present, they would compete successfully with every other breed, and with more attention on the part of the public to quality of flesh, would stand alone as a flesh-producing breed.

CLIMATIC INFLUENCES ON THE PRODUCTION AND HARVESTING OF CROPS.

Mr. Love's speech at the Council Dinner discussion of the Yorkshire Agricultural Society, at Sheffield, was one of the best apologies for slovenly farming we ever met with. He knows well what is best to be done in farming. He has a thorough knowledge of good implements—good workmanship—good management. He has seen it in all its phases—in all its forms—and he can special plead and interest a meeting as well as any man we ever saw. His speech at Sheffield struck on the meeting like an electric shock—it dashed away the dull formalism into which the meeting had run, and it excited a smile on the most determined and serious faces. Mr. Outhwaite's shock, which we gave an idea of in our previous *Journal*, and which is so protected and *thatched*, straw by straw, as to stave off the rain for a matter of six weeks, was never more brought into contrast with anything than Mr. Love brought it in juxtaposition with the loose and hay-like manner of getting corn. He said, for instance—

"He strongly recommended that farmers of one district should not presume to dictate to those residing in another and distant part of the country; for most assuredly they would frequently find modes of working adopted only because of their peculiar adaptation to particular localities. He had had experience in the West of Scotland, and afterwards in the East of Ireland. In Scotland the climate was bad, but on arriving in Ireland he found it worse. In every place in which he had

resided, his chief object had been to get the corn home as well as possible, so that the joyful period of 'Harvest home' might indeed be joyful. But in many instances the very care he had taken to get the corn well, had proved the means of delaying the process of getting it home to the rick yard; and until that was done he did not consider the finishing stroke of the harvest applied. When he went to reside in Northamptonshire, he saw them cut splendid crops of barley and oats with the scythe, the same as we cut hay in this part. After living there two or three years, he found that a better sample of corn could be obtained for market by their method than by harvesting and stooking it, because the majority of the seasons were dry; consequently the corn would have become parched, if not cut and harvested speedily. The principal thing, to his mind, appeared to be, after getting the corn, to put it into a safe position. It behoved every one to study the climate in which he lived, and so get in his crops in the way best suited to it. Therefore, when a farmer changed his position, it would not be a bad plan to ascertain how much rain fell during the harvest months of the previous twenty, thirty, or forty years, in the district which he had adopted as his home; and to ascertain whether he would adopt the slovenly system of the south, or the more careful one of the north. What appeared to be slovenly to the men of the north, might not be slovenly; and that which was apparently careful, would not be considered such by men born in the locality in which that system was adopted."

No man knows better than Mr. Love the effect which this powerful contrastive speech had on the meeting contemplating the Bainesse shock; nor was his speech generally correct—any real apology for bad farming, though it had that appearance; and really it was more to add to the amenities of the meeting than to add much to the love of Yorkshiremen for slovenly modes of harvesting.

Still the principles involved in Mr. Love's speech were full of weighty import. They involved the whole cycle of agricultural science; for there is no part of science or skill which may not be modified by differences of climatic influence.

We hardly know whether to praise the essay which won the Royal Agricultural Society's prize—the second one which that Society printed—or one which has since been printed in the *Quarterly Journal of Agriculture*, by Mr. Rowlandson; for while the first-named enters more into the theory of climate, the latter is eminently a practical essay, and contains a vast mass of well-arranged and general information.

Taking the question of rain alone, and comparing the north-west with the south-east, we have amazing contrasts. Thus the fall of rain at the following places is as under—

Scarthwaite, Cumberland.....	151.87 inches.
Langdale Head, Cumberland	136.
Grassmere, Westmoreland	121.08

Then contrast this with the following—

Epping, Essex	23 65 inches.
Uckfield, Sussex	25.03
London, Middlesex	25.

Now taking a whole range of plants—the very keystone of farming—turnip, clover, rape, &c., and while a moist and humid climate is the very life of these, a drier climate is equally favourable to the wheat and the barley—Mr. Rowlandson sums up the result of his observations in the general remark that the south-east and east of England, and the north-east of Scotland, with a mean summer temperature of 59 to 60 deg., is suited to the production of wheat, barley, and the legumes; while the moist climates of the west of England, Wales, Ireland, and the south-west coast of Scotland, is favourable to the production of root crops, grass, and oats. He makes out, however, in the course of his essay, that high manuring may do much to overcome climatic influence, for Lancashire, unfavourable as to climate for the growth of wheat, is made quite capable of producing it by the liberal application of artificial manure brought from the towns, and by the canals, rivers, and railroads, which pervade that county.

His disquisition on the practicability, or success rather, of the four-course system of husbandry on the western side of the island, are painstaking and full of interest. Laying the foundation of that system, as it really does, in the green-crop system, it would appear at first sight that the best mode of growing wheat was to manure heavily by large quantities of stock fed on the green food which the land produces so readily, and then inserting a crop of wheat or oats, which may be cultivated under such circumstances to great advantage.

But the great drawback of a wet climate is the weeds. In green crops, growing rapidly, and much ploughed and horse or hand-hoed, there are abundant means of clearing the land. But when a corn crop long occupies the land, and when deep stirring of the soil is not so easy, the plants suited best by a moist climate—the weeds—make greater head than they ought; while the plant unsuited to much moisture—the wheat—progresses slowly.

But our climate is fast changing. The extensive, the almost universal drainage, is fast denuding the atmosphere of its moisture. The diminution of actual evaporation, the reducing of the time during which it takes place, are thus diminishing in a double manner the moisture in the atmosphere. And our mill streams are finding out the difference in a remarkable degree. Once the streams ran slowly and continuously: the cracked surface of the land held the water, and there were few floods which made the mill idle through back-water; but the stream filtered through the soil slowly and gradually, and kept up a supply till the next rain fell. Now it is fast taking to exactly the reverse. The drains take up all the water in a very few hours, and force it into the stream; hence there is a *flood* from a rain which before would produce little im-

pression on the soil, and there is a want of water from a few dry days which was before unthought of. This, while it will render ordinary water power of far less consequence and utility, is also indicative of the atmospheric and climatic changes which are slowly and gradually taking place. This will assimilate the differences of our climate very considerably, and will be found very much to modify local modes of farming, adapted to peculiar situations.

Whether in hay time or harvest, however, it is always safest to adopt the most careful mode of securing the produce. The loose cock in hay time is not a costly process, even in a dry climate, and will almost pay for the chance of rain, for it can do no damage. To put barley in sheaves can do no harm in the dryest climates; and to hood wheat is generally a good plan. Where care can do no harm it is best to adopt it: one never can forgive the slovenly mode of getting barley practised in the south of England. — Gardeners' and Farmers' Journal.

THE ROYAL AGRICULTURAL IMPROVEMENT SOCIETY'S BANQUET IN GALWAY.

If, in observing last month upon the exhibition of stock and implements at the show of the Royal Agricultural Improvement Society of Ireland, held at Galway, we expressed some disappointment, we feel amply compensated for any short-comings on that head by the sound, truthful, and patriotic observations addressed by the Lord Lieutenant, the Earl of Eglinton, to the parties assembled at the Society's Banquet—a full report of the proceedings at which we have appended. Had his Excellency been a native of Ireland his language might have been couched in terms of more fervid eloquence, but it could not have produced a greater effect upon the steady and reflecting portion of those who heard him, or who may read in the journals of the day his most excellent remarks having reference to "Prosperity to Ireland." It will be perceived that after referring to the heart-burnings and animosities which so lamentably distinguished the late general election, his Excellency observed, in reference to his visit to Galway:—

"I come to urge upon you to unite heart and hand with each other in cultivating that rich soil which will so amply repay your labour. Depend upon it, gentlemen, the colour of your crops is of far more importance to you than the colour of your flags—(cheers)—and you will find far more to learn in the neighbouring showyard than in any political harangue, be it from a Liberal or be it from a Conservative. (Loud cheers). I believe there can be no doubt that on the proper cultivation of the land all real prosperity is based, and that from that root all other prosperity, whether it be commercial or manufacturing, must spring. (Hear, hear). Cultivate your land, reclaim your waste lands, drain and manure your fields, cultivate flax, turnips, and mangold-wurzel, and only be at peace with each other, and the tall chimneys and busy factories, the heavy trains and the laden ships will follow after, and the merchandise of the world will fill your noble bay, and the waters of Lough Corrib will bring down the commerce of the interior into the midst of your town." (Cheers).

More sound and statesmanlike advice could not be given, but unfortunately, from the character of the country, we fear not applicable to the immediate neighbourhood of Galway; and such seems to have been the opinion of the Lord Lieutenant himself, for he went on to say—

"To return to what is of very great importance to you and to the town of Galway, I cannot but bring to your minds the fact that all the riches of the earth are not above ground (Hear). There may be a great part of your county which is barren and covered with stones; but may there not be mineral wealth below those stones sufficient to repay the utmost labour you could employ? (Hear). I know by my own experience in Scotland that acres of ground have been proved to teem with mineral wealth which no person dreamt of ten years ago; and estates which were only worth a few hundreds are now valued at as many thousand pounds (Hear). I am aware that there are mines already in operation, but I believe that the produce of those mines is a very small item in comparison with what may be yet produced; and I cannot but think that, with the railway now opened to your city, with the fine bay that lies before you, and with the internal resources of Lough Corrib and Mask, Galway cannot long remain stationary" (loud cheers).

It must have been cheering to those interested in the land around Galway to have the idea suggested to them that "all the riches of the earth are not above ground;" for a more barren, inhospitable appearance than the surface of the soil presents, it has rarely been our lot to meet with. Nature has given to Galway a splendid "bay," and Art has conferred upon her the advantage of an iron road. If there be "mineral wealth" beneath the soil, and if these sources of wealth be made available by the spirit and energy of the inhabitants of the "City of the Tribes," she may become substantially that which she is now entitled in Ireland, "the Metropolis of the West." But what are the impediments to such a successful and much to be desired result? Let the Lord Lieutenant answer:—

"My opinion is that the whole history of Ireland's difficulties lies in a very small compass (Hear). Is it the character of the people which unfits them for happiness and greatness? So far from that being the case, I will venture to say that there is not a people in the world whose perceptions are so keen, whose intellects are so quick, whose are so warm, or whose good feelings are so easily excited (Hear, hear). Is there any dulness in the eyes of the daughters of Erin? or is there any inaptitude in their fingers for the most delicate handy-work? Is there any slowness of comprehension amongst

their children? I will appeal to my noble friend on my right (the Lord Chancellor), who is one of the Board of Education—I will appeal to him because he has seen your own model schools to-day, and I will answer for it myself, because I made it my business to investigate the system of education since I came to this country, and I will venture to say that there is not a country in the world where the children exhibit so much cleverness, so much docility, or so quick an apprehension (cheers). Is it the character of the climate or the nature of the soil? There is not a brighter or a richer spot upon this earth than the Emerald Isle. A more genial climate does not exist. (Hear). Is it a want of freedom? The world has not seen so free a constitution, or institutions by which, individually and collectively, liberty is so closely hedged in. (Hear, hear, and cheers). Gentlemen, *Ireland's miseries are to be traced to the disunion and strife amongst her children—to the feuds which prevail amongst them—to the turbulence which prevents the employment of her industry, the development of her resources, and the outlay of the strangers' capital. If her children would live together as brothers, instead of foes—if they would be true to themselves and to her, we should hear no more of Ireland's difficulties; the Atlantic would cease to bear so many homeless wanderers upon its waves.*"

When her Majesty Queen Victoria graciously honours a Cattle Show in England with her presence she is accompanied by his Royal Highness Prince Albert, her exemplary consort, and two or three ladies of her suite. When the Lord Lieutenant of Ireland makes a similar visit he is preceded by police on horseback (soldiers in another dress) with drawn swords, and followed by police on foot armed with muskets. In England a few police unarmed are ranged here and there to clear the way and keep order—in Ireland the muskets of the police piled up in the yard form a part of the "implements" exhibited. To the mind unaccustomed to such sights, the feelings aroused are painful in the extreme. It is distressing to be driven to the conclusion that such a display is necessary to suppress the "turbulence" of the people, and to put down "the feuds which prevail amongst them." It is degrading to humanity to know that "the development of the resources in, and the outlay of the stranger's capital" upon so fine a country are prevented by the disunion which exists amongst those who should "live together as brothers." Until, however, this "turbulence," this "disunion and strife" are suppressed by the force of moral influence, not by an armed police, the bounties of Providence imparted to the soil can never be fully enjoyed by the people.

THE BANQUET.

A temporary banqueting-room was fitted up on the end of the terminus upon a very commodious scale, being ninety feet by eighty. The apartment was constructed in a style of considerable taste and elegance. Above it was covered throughout with an awning of calico, coloured alternately blue, red, and white. White pilasters were run up the walls, festoons of red and blue calico gracefully depending between them. The paces over the festoons were decorated with various and appropoiate armorial bearings; amongst them those of the fourteen tribes of Galway. Immediately over the chair of his Excellency were the armorial bearings of the Eglinton family, and at the opposite end of the room those of the Midland Great Western Railway. The lighting was by eight large Bude burners on the walls, while down the centre of the room 300 gas-burners, arranged on an arched zig-zag line, contributed to shed an extraordinary brilliancy over the festive scene. The tables were arranged for the entertainment of 450 persons. Eight tables ran the entire length of the room, and upon a dais raised a couple of feet at the head was a cross-table for his Excellency and the principal personages present on the occasion. Round the walls were seats for the accommodation of ladies admitted as spectators. Altogether the design and decorations of the apartment evinced the great taste and judgment of Mr. Cheyne, the district engineer, to whom the task was confided.

Shortly after five o'clock, his Excellency entered the banquetting-hall, and was received with enthusiastic cheering, the band of the 9th Regiment of Infantry, stationed in an orchestra erected immediately opposite the chair, playing the National Anthem.

His Grace the Duke of Leinster presided.

On the chairman's right sat his Excellency the Lord Lieutenant, the Lord Chancellor, the Earl of Mayo, Earl of Donoughmore, Earl of Clancarty, Lord Bellew, Lord Castlemaine, Sir Thomas Blake. Count D'Alton, Sir Percy Nugent, Sir Edward Borough, Bart.; M. J. Blake, M.P.; Captain Hand. On the left the Earl of Howth, Earl of Clonmel, Lord Clanmorris, Lord Oranmore, Sir Thomas Redington, the High Sheriff of the county; Mr. Anthony O'Flaherty, M.P.; Captain Bellew, M.P.; Lieutenant-Colonel Laird; Mr. B. Wade.

The vice-chair was occupied by Lord Clonbrock. On his right was the Earl of Erne, Lord Talbot de Malahide, Lord Dunlo, Sir Edward Kennedy; on the left—Lord Dunsandle, Lord St. Lawrence, Mr. J. L. Napper.

Amongst the general company were noticed:—Mr. John Ennis, Chairman of the Midland Great Western Railway; Mr. Boyd, Vice-Chairman, do.; with Messrs. Boyce, Perry, Gaynor, Watson, and Cooper, directors; Mr. Dargan, Mr. Hemans, Mr. Mulvany, Commissioners of the Board of Works; Mr. Griffith, Chairman of the Board of Works; Major Woodburne, Mr. James Sadlier, M.P.; Mr. Richard Armstrong, barrister; W. H. F. Cogan, M.P.; Hon. F. French, Hon. Robert French, Mr. Burke (St. Cleran's), Mr. James Power, D. L., Mr. George Roe, Mr. Hutton, T.C., Mr. Jeffreys, Mr. Robert St. George, Hon. Mr. Lawless, Hon. Mr. Dillon, Mr. Bland, M.P., Mr. F. Scully, M.P., Mr. John Law, Mr. Robert Maxwell, Sir Thomas Burke, Mr. G. Thunder, Mr. Dudley Persse (New York), &c.

The health of the Queen and the other members of the royal family having been drunk with all the honours,

The Noble PRESIDENT then rose and said, it gave him very great pleasure to propose the next toast on his list, and in doing so, he wished them to understand that he meant to adhere strictly to the rules of the Royal Agricultural Society, which required its members to abstain from any allusion to politics (Hear, hear). They were highly honoured that evening by the presence of the Lord-Lieutenant of Ireland (loud cheers). On all occasions when he had given them a toast it had been responded to as it ought to be by that society; but in the pre-

sent instance he must call upon them to assist him in doing honour to that toast (cheers). His excellency, since he came amongst them, had shown the greatest anxiety to visit the most important cities of Ireland, and as president of that society, he thought it was exceedingly fortunate for them all that he had come so far west to honour them with his presence, because he was certain from his doing so that theirs was a society which ought to be supported, and therefore he proposed, with no ordinary feelings of pleasure, "The Lord-Lieutenant, and Prosperity to Ireland" (cheers).

The toast having been received in a most enthusiastic manner, the entire company standing up and giving cheer after cheer in honour of his excellency—

His EXCELLENCY rose to respond, and his rising was the signal for a fresh burst of applause, which was renewed again and again for several minutes. When silence was restored, he said—My Lord Duke and Gentlemen, I thank you most sincerely for the honour you have just done me, and I thank you still more sincerely for the sentiment with which you have coupled my health—a sentiment which not one of you, however Irish you may be, even though you may be one of the tribes, can respond to more cordially than I do. (Loud cheers). It has been my good fortune on every occasion that I have met with an assembly of Irish men since I came to this country, to be received with that cordiality of welcome which must be gratifying to every man, but which is peculiarly so to one in the position that I occupy, and which tends to render the many onerous duties with which I am sometimes beset far smoother (Hear). Believe me it is no small satisfaction, when I turn from the arduous part of my office, and leave the sterner duties which now and then devolve upon me, to be met by smiles and friendly greetings, and to accept it as a proof that I have not lost the good opinion of those for whom I have toiled and for whose welfare I am so earnestly solicitous (loud cheers). For your kindness, personally, I feel most grateful to you, but I feel it far more as a homage paid to me as the representative of your Queen; I accept it as a proof of your loyalty to your Sovereign—a loyalty which, dim and confused as that holy feeling has become in other countries, where men know not whom to obey or whom to reverence, and where the despot of to-day may be the exile to-morrow—burns bright and unmixed amongst us, and is a feeling which we have received from our forefathers, and which we mean to transmit to our children (vehement cheering). I accept it as a homage paid, not only to the sovereign of this mighty empire, because it shows that you feel that on the stability of the throne depends the tranquillity, the liberty, and the constitution of this kingdom, but to the individual, because it shows that you feel that she presents a private character and exhibits public virtues which would be an honour to anybody in private life, and which have endeared her to every class of her subjects (cheers). Gentlemen, I come to Galway at a time when the turmoil, the excitement, and the heart-burnings of that great but necessary evil, a general election, has scarcely subsided—when, perhaps, many who have been friends from their youth have separated from each other on a hasty word, a harsh expression, or a political accusation. Be it my duty to pour oil on those passions—be it my duty to allay those animosities, to restore those friendships (cheers). I am not aware that the men of Galway showed any especial favour to those who professed my political views (laughter), but I come to Galway not the less willingly for that (loud cheers). I do not come to Galway as a politician nor as an electioneerer. I come here as the Chief Governor of Ireland, anxious to allay all animosities, all asperities, to sanction by my presence, to promote by my advice and example, those great interests which are essential to every country, but are more important to Ireland than to any other (cheers). I come to urge upon you to unite heart and hand with each other in cultivating that rich soil which will so amply repay your labour. Depend upon it, gentlemen, the colour of your crops is of far more importance to you than the colour of your flags—(cheers)—and you will find far more to learn in the neighbouring showyard than in any political harangue, be it from a Liberal or be it from a Conservative. (Loud cheers). I believe there can be no doubt that on the proper cultivation of the land all real prosperity is based, and that from that root all other prosperity, whether it be commercial or manufacturing, must spring. (Hear, hear). Cultivate your land, reclaim your waste lands, drain and manure your fields, cultivate flax, turnips, and mangold-wurzel, and only be at peace with each other, and the tall chimneys and busy factories, the heavy trains and the laden ships will follow after, and the merchandise of the world will fill your noble bay, and the waters of Lough Corrib will bring down the commerce of the interior into the midst of your town. (Cheers). Gentlemen, I gave my attention to the exhibition with the greatest pleasure and with the greatest care, and it afforded me the utmost satisfaction to see an exhibition so gratifying in all respects; and, if you will allow me to use a word—of so "average" a character; and in using that word, I think I have said a great deal, for I have seen a great many shows, and I hold that this exhibition does much credit to the capital of the west. (Cheers). If you will allow me to particularise amongst the stock that which particularly met my approbation — if my approbation is worth having—I may mention that I most especially admired the sheep, and I believe it would be difficult to find at any show in England or Scotland a better exhibition. (Cheers). There is nothing has astonished me more in that line, since I came to Ireland, than the great and manifest improvement that has taken place in the pigs. (Hear). I remember that only a few years ago they were very inferior, and now I believe that they will bear comparison with those of any other country. (Hear, and cheers). I, of course, in common with you all, must admire and approve of those large animals that carry so much fat upon them, but—it may be an opinion of my own—I cannot but wish that more attention was paid to milch cows, because the short-horns, excellent as they are for fattening, run too much to fat, and I do not think that they give that proportion of milk which some other sorts are able to yield. (Hear, hear). There was a little Derry cow in the yard which particularly attracted my attention, and which I think is well worthy of your observation. When I state, as I have been told, that she gives 30 quarts of milk a-day, I think she will bear comparison with any shorthorn in the world (Hear, hear). But, before I leave the exhibition, I cannot help alluding to one part of it, which added more than all else to the brilliancy and attractiveness of the show-yard—I mean the fair exhibition which now graces the walls of this building (cheers). Upon the merits of that I believe there can be but one opinion. I am not aware whether any judges have been yet named for that department; but if the selection is about to be made, I offer myself as one of the candidates. Gentlemen, to return to what is of very great importance to you and to the town of Galway, I cannot but bring to your minds the fact

that all the riches of the earth are not above-ground (Hear) There may be a great part of your county which is barren and covered with stones; but may there not be mineral wealth below those stones sufficient to repay the utmost labour you could employ? (Hear.) I know by my own experience in Scotland that acres of ground have been proved to teem with mineral wealth which no person dreamt of ten years ago; and estates which were only worth a few hundreds are now valued at as many thousand pounds (Hear). I am aware that there are mines already in operation, but I believe that the produce of those mines is a very small item in comparison with what may be yet produced; and I cannot but think that, with the railway now opened to your city—with the fine bay that lies before you, and with the internal resources of Lough Corrib and Mask, Galway cannot long remain stationary (loud cheers). Now, gentlemen, to take a more general view of the toast which you have proposed, and to allude in a few words to the latter and better portion of it—the sentiment coupled with my name—I may say, my opinion is that the whole history of Ireland's difficulties lies in a very small compass (Hear). Is it the character of the people which unfits them for happiness and greatness? So far from that being the case, I will venture to say that there is not a people in the world whose perceptions are so keen, whose intellects are so quick, whose hearts are so warm, or whose good feelings are so easily excited (Hear, hear). Is there any dulness in the eyes of the daughters of Erin? or is there any inaptitude in their fingers for the most delicate handy work? Is there any slowness of comprehension amongst their children? I will appeal to my noble friend on my right (the Lord Chancellor), who is one of the Board of Education—I will appeal to him because he has seen your own model schools to-day, and I will answer for it myself, because I made it my business to investigate the system of education since I came to this country, and I will venture to say that there is not a country in the world where the children exhibit so much cleverness, so much docility, or so quick an apprehension (cheers). Is it the character of the climate or the nature of the soil? There is not a brighter or a richer spot upon this earth than the Emerald Isle. A more genial climate does not exist. (Hear). Is it a want of freedom? The world has not seen so free a constitution, or institutions by which, individually and collectively, liberty is so closely hedged in. (Hear, hear, and cheers). Gentlemen, Irelaud's miseries are to be traced to the disunion and strife amongst her children—to the feuds which prevail amongst them—to the turbulence which prevents the employment of her industry, the development of her resources, and the outlay of the stranger's capital. If her children would live together as brothers, instead of foes—if they would be true to themselves and to her, we should hear no more of Ireland's difficulties; the Atlantic would cease to bear so many homeless wanderers upon its waves. (Hear, hear). But, gentlemen, there is another ingredient in the case. The Government must also be true to you, and wield impartially, but firmly, the powers with which they are constitutionally vested, and I shall pledge you my honour, so long as I remain amongst you, neither will partiality lead me to deviate from the straight path, nor censure ever deter me from pursuing that course which in my conscience I feel to be right. Now, gentlemen, I have done. It may be long, although I hope it will not be long, before I revisit Galway; but I shall carry away with me a warm and affectionate recollection of the kindness you have shown to me. I conceive that it is quite as much my duty to make myself acquainted with the character and the feelings of the peop'e, and with the capabilities of the country placed under my charge, as to execute the functions of the government. That such is your opinion I have only to appeal to the manner in which I have been received, and I should consider myself as wanting in that duty if I had been absent on an occasion so important, so interesting, and one which I hope will prove a prelude to years of prosperity to you all. (Vehement cheering, amidst which his excellency resumed his seat).

His Excellency then rose a second time and said—Gentlemen, after detaining you so long, I should feel that trespassing on your time again would be an unwarrantable liberty on my part, if I had not so good a cause to present to you (Hear). It is to propose to you the health of our noble chairman, the Duke of Leinster (cheers). I feel much gratified that it has fallen to my lot to propose that toast, and I know that you would not have forgiven me if I had lost one moment in doing so (Hear). It is a fitting and a graceful thing that the first nobleman of Ireland should preside at this splendid entertainment, and in my opinion it gives additional weight to the Royal Agricultural Society, and to all your endeavours in its behalf, that he should preside at the present banquet (cheers). I am quite sure that the noble duke himself will be of opinion that I am not using the words of flattery when I say that it is impossible to conceive any man filling the high and exalted station which he fills in this country, more to the satisfaction of every one who knows him, or more to his own honour (loud cheers). I am not overstraining the mark when I say that Ireland's duke is the most honoured, the most amiable, and the best nobleman that any country can boast of; and if anything were wanting to add to my gratification at the manner in which my health was drunk by this company, it would be that the toast was proposed by my noble friend the Duke of Leinster (cheers). I beg, therefore, to propose "The health of the noble chairman, his grace the Duke of Leinster."

The toast was received with the warmest demonstrations of applause.

The Chairman said he could assure them that he felt deeply the kind and able manner in which his Excellency had deigned to bring his name before them. His good opinion they might readily suppose was very flattering to him. He was much obliged to the company for the way in which they received the toast. As chairman of the society, it would ever give him the greatest pleasure to forward, in every way he could, its interests. After again expressing his thanks, his grace gave in appropriate terms, "The Memory of Peter Purcell, the Founder of the Society."

The toast was drunk in solemn silence.

The Chairman again rose, and said he should crave their assistance in doing justice to the toast he was about to propose. He had but to mention the name of the distinguished lady, whose health he was about to give them, in order to insure for it the reception it so justly merited (loud applause). It was the health of her Excellency the Countess of Eglinton (here the company rose and cheered enthusiastically). In the welfare of this country her Excellency took the deepest interest (Hear, hear); and he might mention that, when she visited the show on the previous day, and when he had the honour of attending her, she went most patiently through it, and saw every individual beast (a laugh), sheep, fowl, &c., in the yard (Hear). Knowing their anxiety to do honour to the toast, he would at once give them, "The health of the Coun-

tess of Eglinton" (the toast was drunk with all the honours, amid hearty cheering and waving of handkerchiefs).

The LORD-LIEUTENANT rose amid cheers to respond. He said: It is often my duty to return thanks for Lady Eglinton in her absence, but it seldom happens that it becomes my duty to do so in her presence (cheers and laughter). And I feel considerable difficulty in doing so, for two reasons: first of all, because I am quite sure she would return thanks better for herself (loud cheering); and secondly, because I am convinced that if I do it badly I shall hear more about it (loud laughter and cheering). Even in her presence, however, I will say, that all the praises which the Duke of Leinster has been kind enough to bestow upon her are deserved (loud cheers, and cries of "Hear, hear"); and there is nothing dearer to her heart than to promote the prosperity of her native land ("Hear, hear," and renewed cheering). I assure you, as strongly as I feel the duties which have devolved upon me—strongly as I feel the determination within myself to do that duty by the nation placed under my charge—that if I ever failed in it, or if I ever, even for a moment, neglected to do my best for this country, I should have one at my elbow ready to warn me of my dereliction (loud cheers). Strong as the feelings of Lady Eglinton have always been for her native land, I will appeal to you all whether those feelings have not received additional strength from the kindness with which she has been welcomed on all occasions in this country, but more especially by the great kindness you have exhibited on her behalf in Galway (cheers). In returning you, once more, thanks for the honour you have done her, believe it is not merely words from the lips, but, if expression can do it, I thank you from my heart (loud cheering).

The VICE-PRESIDENT, Lord Clonbrock, next gave in eulogistic terms, "The Army and Navy."

Colonel LAIRD, in an eloquent and stirring address, in the course of which he was loudly cheered at his references to the services of the army and navy, returned thanks on behalf of the army.

Captain HAND, R.N., in brief terms, on the part of the navy, acknowledged the compliment paid to that portion of the service.

ANTHONY O'FLAHERTY, M.P., on rising, in obedience to the call of the chairman to propose the next toast, was received with cheers. He referred to the very inferior system of agriculture pursued in this country for a considerable time until within the past few years, when a great deal of improvement was effected through the agency of the Royal Agricultural Improvement Society. Any improvement that had taken place in the mode of cultivating land in Ireland was, he said, mainly attributable to the almost supernatural exertions of the members of that society (Hear, hear). The soil had been brought to a state of comparative fertility, and the foundation had been laid for some increase of happiness and prosperity to the country (Hear, hear). He congratulated the company upon the success of their exhibition in the capital of the west. He stated in the course of a forcible address with reference to the county and town of Galway, that its gentry and people, while at the proper time they boldly maintained their peculiar opinions, were, on all occasions such as the present, and on all their boards, juries, and committees, harmoniously combined, without reference to politics, to promote the welfare of their county and its town (cheers.) After paying several compliments to the members of the society, he concluded by proposing "The Royal Agricultural Improvement Society of Ireland."

The toast was warmly received.

The Earl of CLANCARTY, who was loudly cheered on rising and throughout his speech, returned thanks.

The SECRETARY of the society, Mr. Harkness, then came forward, and read the list of prizes.

The CHAIRMAN presented the silver cup to a gentleman who appeared for Mr. Charles Towneley, M.P., the successful competitor.

At this stage of the proceedings his Excellency retired, accompanied by the Countess of Eglinton, in consequence, as stated by the noble chairman, of his suffering under a severe cold.

Mr. W. B. WADE gave the health of the vice-President.

The toast was drunk with all the honours.

LORD CLONBROCK returned thanks in appropriate terms.

The LORD CHANCELLOR then rose amid loud and repeated cheering to propose the next toast. He said—My lord duke, my lords and gentlemen, I feel it to be a most distinguished honour in such an assembly as that which I have the honour to address, to be privileged to propose a toast, which I anticipate will be received with all the acclamation and favour it deserves. The toast is—"The Judges of the Show Yard" (applause). It is but very recently I was told this honour would be conferred upon me, and I thought that, perhaps, I was selected for the duty from being supposed to entertain a predilection for judges in general (great cheering). But I can assure you that no bias rests upon my mind when I propose to you the judges of the show yard, for I am perfectly persuaded that those who are acquainted with their merits and their services will all concur with me in bestowing upon them the praise of perfect liberality and impartiality (Hear, hear). Without their services vain would be the efforts of this body, and whatever in the way of exertion took place, and whoever may be the persons that made these exertions, they all ultimately looked forward to the fair judgment of those who had to decide upon the merits of the animals exhibited (Hear, hear). I believe I may say, though I am little competent to judge, but I have been informed that never were their decisions more characterized by judgment and impartiality—by fairness and discrimination (cheers). It is perfectly true, I believe, in general, that they have awarded the prizes to the fattest of the fat; but at the same time I am persuaded from all I have heard, that they have not been negligent of symmetry and beauty—(Hear, hear)—and I am also persuaded that it was this attention to symmetry and beauty that suggested to the Lord Lieutenant the idea of extending their jurisdiction to another species of live stock—(laughter and cheering)—when he proposed that they should have under their jurisdiction the magnificent display of beauty which encircles these walls (Hear, hear). I am persuaded he was not fully aware of the difficulties of the task he would impose upon them or upon himself in becoming the foreman of that tribunal, for I am convinced if such a tribunal were formed to decide upon such a subject, such would be their difficulty and distraction, that, whatever might be the mode of trial, whether by inspection or examination—(laughter)—the judges would die in doubt (renewed laughter and loud cheers). I therefore believe that for their sakes—that is, for the sake I mean of those proposed to be the judges—it is better to allow them to remain without extending their

jurisdiction to subjects of such great difficulty (laughter, and cries of "Hear"). Having proposed the health of the judges, I have only to observe upon one topic more. Throughout the interesting subjects so admirably, so feelingly, and so wisely discussed by the Lord Lieutenant, there was one element mentioned, and to which you are to look forward for the regeneration of the country. His Excellency alluded to that element in connection with my name—I mean the intellectual powers of our people (cries of "Hear, hear"). And his Excellency having referred to what passed under my own observation today, I will state that I visited an institution but three weeks in existence, for the purpose of seeing how it worked, and whether it had as yet produced any effects upon those entitled to the blessings of the institution itself, and I never in the whole course of my life was more surprised at all the elements of order, of intellectual acuteness, of perfect propriety of demeanour, than were exhibited by all the numerous classes of the new National Model School (Hear, hear). It was most gratifying to see the acuteness, the intelligence, the capacity for receiving instruction, and the aptitude for retaining it, of the boys, but, above all, their complete submission to the rules of the institution once they came within its walls. I was perfectly amazed to find in so short a time such a body of scholars exhibit such qualities, to which I have to add a peculiar neatness of dress and propriety of demeanour (Hear, hear.) Where there are such elements to look forward to as springs of future greatness and improvement, I say no nation should despair (Hear, hear, and loud cheers). It would be a miracle, if, with the great advantages extended to this part of the world, the communication with the metropolis by railway opened, the great national institution of a college within a few yards of this town—those national schools which extend to all classes and denominations the benefits and blessings of education—if in addition to all these you take the great internal communication about to be afforded by the opening of Lough Corrib, together with all the other means at your disposal for making the county productive, and its talent redound to the benefit of those who possess it and to the community at large, I repeat it—if with all these advantages Galway fails to profit, I shall despair of seeing any nation increase in prosperity (cheers). It is but one year since the railroad was opened to this city, and when in an assembly on that occasion, constituted nearly as the present is, I had to make a few observations, I spoke of that great event. Great events have since occurred, and they have occurred to lay the foundation of an amount of prosperity and happiness which, I trust, many here present will live to see perfectly and effectually realized. His lordship then resumed his seat amid loud applause.

Mr. TORR returned thanks on the part of the judges, and said that, for his own part, he felt grateful for the kind manner in which the company had been pleased to notice the exertions of those whom he then represented. If anything could add to the gratification which the judges must feel at the manner in which the company received the toast, it was the very flattering terms in which it was proposed by a man of the greatest eminence in Ireland as a judge himself. (Hear, hear). He (Mr. Torr) could say that the judges of the show-yard had performed their duties to the best of their ability, and with perfect fairness. (Hear, hear). He regretted very much that he could not repeat the congratulation which on former occasions he had offered them respecting the success of the show; but he would say that in the part which justly belonged to that portion of the country several splendid specimens of what were commonly called Ballinasloe sheep were brought under their notice. (Hear, hear). Having said so much upon the subject, he would observe, as an Englishman, that his countrymen were most anxious for that prosperity for Ireland which she so well deserved. After a few more remarks, Mr. Torr concluded by stating his belief that Ireland possessed within herself all the materials and resources necessary to render her one of the richest agricultural countries in the world. (Hear, hear).

Mr. THOMAS A. JOYCE (High Sheriff), in proposing the "Successful Competitors," said that, though an unsuccessful competitor, he experienced great gratification in performing the duty which the committee had imposed upon him (cheers). He might express his hope that Galway would derive benefit from the great exhibition which had just taken place (Hear, hear). Where, he would ask, was the locality so favoured by its geographical position, and why then was it so much behind the sister country in prosperity? He had no hesitation in saying that this was in a great degree attributable to the want of that fostering care which the laws of nations required, and humanity demanded for this country (Hear, hear). He would, however, be wanting in courtesy if at that late hour he would detain them from drinking—"The Successful Competitors."

The toast was cordially received.

Sir THOMAS BURKE, Bart., M.P., briefly returned thanks.

Lord TALBOT DE MALAHIDE, in an eloquent address, during the delivery of which he was repeatedly cheered, gave "The City of the Tribes."

Mr. M. J. BLAKE, M.P., responded to the toast, which was drunk with all due enthusiasm and respect.

THOMAS BELLEW, M.P., in an eloquent speech, gave the "Ladies."

The toast was drunk with all the honours, amid loud and repeated cheering.

Mr. EDMOND O'FLAHERTY responded on the part of the ladies for the honour done them.

The CHAIRMAN next gave the "Efficient Public Boards of the Town of Galway," which was duly honoured.

The Rev. PETER DALY, P.P., on rising to respond, was received with cheers. He said that at that time of night, and after all the eloquence that had delighted them, he would not think of detaining them for any length of time. He would only say, as a member of some of the public boards of Galway, that the magnificent assembly round him was in itself a proof of the efficiency of the public boards of Galway (Hear, hear). He trusted the proceedings of the week would aid in making Galway what nature intended it should be, a great emporium of trade and commerce (Hear, hear). With reference to the line of railway connecting that city with the metropolis of Ireland, he believed he was in a position to say, that to the public boards of Galway was due some of the credit for originating the project, although others undoubtedly lent their honest aid to the carrying out of the idea (Hear, hear). He trusted they would all live to see Galway what she ought to be, a place of great commerce, and the entrepot between the Old and the New World (applause). He trusted it would be admitted on all hands that the harbour commissioners had established a case for the harbour of Galway, which would result, in due course of time, in a large proportion of the commerce of the world passing through the town (Hear, hear), and that it would

become the combining link in good feeling, in civilisation and trade, between the great nations on both sides of the Atlantic. (Loud cheers).

ROBERT BODKIN proposed the "Royal Dublin Society, the Highland Society of Scotland, and the Royal Agricultural Society of England."

The toast having been drunk,

J. W. NAPER returned thanks.

Mr. THOMAS BALL gave, in an effective speech, the "Local Committee," which was spoken to by Captain Shawe Taylor.

R. A. D. KIRWAN, Esq., proposed the Midland Railway and other public companies who have aided, by their liberal arrangements, in promoting the success of the meeting.

The toast was received with loud cheers.

Mr. JOHN ENNIS returned thanks.

The Chairman then gave the last toast on his list, "Our next merry Meeting," which having been warmly received, the company separated.

The Show terminated on Friday, and altogether may be put down as having proved an interesting and decidedly successful exhibition. No incident occurred in the show-yard that day worth remarking.

THE BENEFICIAL INVESTMENT OF CAPITAL IN LAND.

We have shown in preceding articles, on the testimony of the highest agricultural authorities, the large profits which attend the improvement of poor soils, and the beneficial investment which the purchase and improvement of such soils furnish to individual or associated capitalists. We have pointed out "looming"—and more than looming—in the distance, the employment which may be afforded to a large amount of capital in providing the necessary fixed apparatus for distributing the manure of the farm in the liquid state, as well as for conveying hydraulically the refuse of towns to the rural districts, and for distributing it over the land, whenever the agricultural body shall abandon their opposition to these two innovations, and shall adopt liquid manure as unreservedly as they have adopted guano, dissolved bones, and mineral phosphates of lime, all decided once as equally visionary. We have considered also the advantage which farmers would derive from agricultural banks receiving deposits, as permanent investments, or for a term of years, and being thus enabled to afford accommodation for those periods which agricultural operations require, and which are longer than can safely be conceded by ordinary banks of deposit. We have pointed out the benefits which Scottish agriculture has derived from the Scottish system of banking—the accommodation afforded by its cash credits, and the check which the two securities required under that system present to improvident borrowing. It remains to discuss another Scotch practice, affecting the monetary transactions of agriculture, by which a farmer in that part of the United Kingdom is enabled to begin business with a smaller capital than would be required in England—we allude to the system which prevails in some of the best cultivated districts of North Britain of separating the business of stock-keeping on arable land from that of cultivation. Instead of purchasing sheep and cattle to consume his turnips and cultivated grasses, the farmer sells those crops by the acre to stockmen, with the use of his yards and buildings, and the requisite supply of straw. There is a double advantage in this system: it not only economises capital, but it effects that division of labour which conduces to perfection in every art, whether the art of manufacturing hardware and calico, or the art of manufacturing beef and mutton, corn and cheese. Instead of two men managing separately each his farm of 300 acres, each of them expending half of his time at market and fairs, they unite for the management of one farm of 600 acres; they have, in fact, all the advantages of a partnership without its inconveniences, each partner, or *quasi* partner, applying himself to the exclusive superintendence of that department in which he excels. The farmer devotes his whole time and attention to the raising of his crops; while the stockman makes it his business to frequent fairs and markets, watching advantageous opportunities of purchase and sale, and acquiring that knowledge of the value of stock which nothing but extensive and long-continued practice can confer. Much of the profits of farming depends on this skill in the purchase and sale of stock. There are many who can raise a good crop of turnips or clover for one who can convert them profitably into beef and mutton.

Not a few of our agricultural friends set themselves against practices which originate north of the Tweed, while they look on them with favour if they can persuade themselves, or if some one can persuade them, that similar practices ever existed, though now disused, in some corner of old England. It was thus with the Deanston system of parallel equidistant drains. It may propitiate such readers in favour of the division of labour in arable farming which we are now advocating, to know that a system very similar has long prevailed in some of the dairy districts of the south-west of England. In Dorsetshire, for instance, it is usual for the occupiers of farms having much meadow land attached to them, to stock them with cows, which they let to dairymen at prices varying with the nature of the keep and the quality of the stock from £8 to £12 per head. We know one farmer who occupies 1,500 acres of meadow and pasture, consisting formerly of five or six separate farms. He does not even milk a cow for the use of his house, but purchases all the dairy produce which he requires of the dairymen to whom he lets his cows, and who occupy the old farm houses. The arrangement is equally beneficial to both parties. They have the benefit of his capital with avoidance of the risk or loss from deaths: he has

the benefit of their skill, and of that attention to the minutiæ of dairy management which they are more able to bestow, and on which so much of its success depends.

If the cultivation of flax is to make much progress in England, it must be through the adoption of a similar division of labour, which will separate the preparation of the fibre from the growth of the crop. The establishment in districts where the flax culture already exists, or might be introduced, of retteries for the purchase of the straw from the grower, and the preparation of the fibre for the spinner, opens another and a wide field in which, we believe, that capital might be embarked with equal benefit to the moneyed and agricultural classes.

In closing our observations on the means by which the present glut of unemployed capital may be turned into agricultural channels, we could have wished to offer some estimate of the amount which agriculture is capable of absorbing. In the present state, however, of agricultural statistics this is impossible.

It was calculated, some seven or eight years ago, that to drain all the cultivated land in the United Kingdom which requires draining, to reclaim all the wastes capable of being reclaimed, and to raise the average amount per acre of the tenants' capital to what it should be, would employ a sum little short of eight hundred millions—the amount of the National Debt. During the interval some progress has been made in these improvements. It would be an extravagant estimate of the sum thus expended to call it five millions a year. Assuming it as high as that amount, there would still remain full seven hundred and fifty millions required for the three heads of improvement above enumerated, to say nothing of warping, embanking, irrigation, and claying and marling. Whenever the application of liquid manure by means of the steam-engine and under-ground pipes shall become general, it will require an outlay of about £4 the acre; to which must be added, in order to utilize the sewage of towns, the cost of mains for its conveyance into the country. Not to provoke incredulity, by attempting to calculate the sum which would be required for these purposes, and which, from the imperfection of the data would be little better than conjecture, it may be safely affirmed—that the work of developing the latent resources of our soil would employ the annual sum of ten millions yearly for many years; that such an application of that sum would be highly advantageous to the farmers and landowners of the United Kingdom; and that it would afford a much safer and more profitable investment to the moneyed interest than most of those in which they have hitherto embarked, whenever the rate of interest is low, and in which, under similar circumstances, they will be tempted to embark again. We have already intimated that the impediment which most obstructs the flow of capital to our fields arises from the farmers having allowed themselves to be made political capital of by trading politicians. They have been deluded long enough into the pursuit of unattainable objects; let them, at length, turn their attention to practical questions. One of the most important of these, at the present moment, is how to obtain the use of some of that capital that is now going a-begging. Let them remember, that if they would gain the confidence of capitalists, they must cease to cry stinking fish. T.

A NEW METHOD OF HOEING TURNIPS.

By Philip Pusey.

(From the *Journal of the Royal Agricultural Society.*)

Before detailing an improved method of hoeing turnips, discovered by me during the leisure from public duties which has been afforded me in the present month of July, it will be useful, as some readers of this journal may not be practical farmers, to state the defects of the existing methods.

According to the old-fashioned practice, still the most common in this, and, I suppose, some other counties, the turnips are sown broad-cast. Afterwards, in order to thin out superfluous plants, to get rid of weeds, and to keep the soil open, they require three hoeings by hand, which cost together at least ten shillings per acre, or half the average rent of English land. Nor is the expense the least evil, for it is of course a slow process to move the whole surface even of a single acre with the common hand-hoe. But on a moderate farm a hundred acres often require this operation at once; the weather may be propitious and the want pressing. All the hands on the farm are insufficient, and no others can be procured. The right time, therefore, for some of the work passes by. Nay, further, it happens constantly that a yet more urgent necessity arises at the same time—the necessity for securing the harvest. The turnips are left to themselves, the weeds almost smother the crop, the surface of the ground becomes baked, and the roots have soon suffered irremediably.

Good farmers, however, have now generally given up sowing their turnips broad cast, and in southern England usually drill them four rows at once, covering a width of six feet. When this is done, Garrett's horse-hoe, passing between the four rows, cleans the intermediate space with the utmost rapidity. Still, admirable as is the process, it has been as yet incomplete. For the young plants shooting up vigorously in the rows under the influence of artificial manure, soon grow together, requiring immediate attendance. If then they cannot be thinned out quickly enough by hand, although, in desperation as it were, the harrow is sometimes dragged across them, they become interlaced, are drawn up prematurely, and the spindling plants, when at last singled out, resemble trees of a plantation that has been neglected in the same manner. Their robustness is gone.

Having 50 acres of turnips exposed to this risk, and no workmen to save them, it occurred to me that Garrett's horse-hoe might be used across as well as along the rows. The indiscriminate slaughter of thriving plants was at first rather

alarming; but when the fallen had withered beneath a scorching sun, it was evident that a good and regular crop remained safe. The whole, therefore, was subjected to the process, and I shall use no other in future. It may be useful then, I hope, to describe the method precisely, because the success of all operations lies mainly in minute particulars, though in this case there are none which any practical farmer might not find out for himself.

In the common use of the horse-hoe the knives pass down four rows at once, and they may safely be set with their backs only three inches apart, though they thus approach within 1¼ inches of the young plants on each side. As the rows are 19 inches asunder, a width of 16 inches is cleared, and about one-sixth of the surface remains untouched.

In the new process, however, of afterwards crossing the rows, the hoe must be set differently, as it would be wrong to leave so few turnips as an interval of 19 inches along the rows would spare. It might also be hazardous to set the backs of the knives at three inches only apart, because even in a regular crop blanks might occur at that interval. As yet, therefore, we have left a space of five inches. In crossing, consequently, ten hoes instead of eight must be used, and five spaces instead of four must be hoed, so that the turnips will stand 15 inches apart along the length of each row.

The next step is to reduce to single plants the small bunches of turnips left by the cross-hoeing; and this is best done by young children—the younger the better—as the smaller they are the nearer they are to their task, and pliancy of fingers, not strength, is the quality wanted. It is easy to borrow, for the purpose, the younger classes of a school for a few days; it is, in fact, a holiday for them in fine weather, and their parents are glad that they should earn 4d. a day. About 30 of these little workpeople, each singling a separate row of turnips, under one steady manager, do the work well and rapidly. It is not uncommon to employ children thus, the turnips having been previously bunched out, as it is termed, with the hand-hoe. The plants which are thus finally left stand in lines, from whatever point they are viewed.

Afterwards it may be necessary, before the plants have spread their leaves and covered the ground, that women should go rapidly over the field with a hoe, merely to strike out occasional weeds, in which last operation each person, I find, can finish off nearly 2½ acres in a day.

The expense of the whole is as follows:—As to the horse work, I am certain that a farmer ought not to charge himself more than half a-crown a day for horses kept regularly at work on the farm. One lad steers the implement and drives the horse with reins at the same time, when the work lies in the direction of the rows, as a quiet horse sees his path plain before him; but in crossing the rows a boy also must be employed to keep the horse straight. The horse-hoe should go over at least eight acres each day.

For eight acres:—	s.	d.
One straight hoeing	3	6
One cross hoeing	4	0
Second straight hoeing	3	6
Children singling, at 1s. 4d. per acre	10	8
Hand-hoeing, at 6d.	4	0
	25	8
One acre completed	3	2½

The saving, therefore, effected by this complete use of Garrett's horse-hoe, as compared with the hand-hoe, is nearly 7s. per acre, about the same saving as we derive from the American reaper.

The cost of the implement is extremely moderate, as Mr. Garrett is ready, at my suggestion, to sell his four-row horse-hoe, fitted for the turnip crop only, at the low price of £14.

I have pointed out elsewhere an important gain, besides cheapness, which arises from improved implements, namely, certainty. Every practical farmer will see at once the advantage, if, by a mechanical process, without checking his harvest, he can carry forward his turnip crop from the time when it peeps above ground until its spreading leaves hide the land from our sight.

There is even a further benefit at which I may venture to hint. It is well known that many parishes of southern England contain at present more labourers than can be easily employed during the winter half of the year. But they are required for about three months in summer, and the farmers are therefore unwilling to favour their removal by emigration. This maximum demand in summer, however, arises from three operations—hay-making, turnip-hoeing, and harvest; if, then, these three several demands for extra labour are reduced by the use of machinery, the pressure for hands in summer being no longer felt, there will no longer be any reason for detaining families whose presence in winter tends to burthen the rate-payer, while their own condition is depressed by the slack demand for their labour.

Pusey, July 31. PH. PUSEY.

Having inquired of Mr. Garrett whether his horse-hoe had been used by others in the same manner, I am glad to learn from him that two other agriculturists at least, perhaps more, have so used it recently, and to subjoin their statements in support of my own. The first is from Mr. Cottingham, of Leiston-hall, who says:—"I have been much pleased with your horse-hoe's performance in hoeing turnips out. Each set of hoes were fixed to cut clean 12 inches, leaving six inches space between each. After the horse-hoe had been taken directly plump across the stetches, they were singled by children, and they now look remarkably well. Of course there was a full plant. My turnips growing so very rapidly this season, if it had not been for your horse-hoe, I should have had many acres much injured for want of getting them out in proper time."

The second account is from Mr. Williams, manager of Mr. Sidney Herbert's farm, at Wilton:—"I commenced the cross horse-hoeing last year on some late-sown turnips, which convinced me that it was practicable, should the plants be regular and without blanks in the rows. The turnips require to be horse hoed as soon as they are in rough leaf. I have this year thus horse-hoed all my mangolds and swedes, and I have found it to be the cheapest, and by far the most perfect method that I have tried or seen. I intend to cut all my late turnips in the same manner."

I understand from Mr. Herbert that his colleague, Mr. Wyndham, has also used the same method successfully.

MR. PUSEY AND HIS NEW METHOD OF HOEING TURNIPS.

TO THE EDITOR OF THE MORNING POST.

SIR,—I read in this day's *Morning Post* an extract from the *urnal of the Royal Agricultural Society*, headed "A New

Method of Hoeing Turnips," by Philip Pusey. Mr. Pusey is well known as one of those gentlemen who, within these few years, have contributed largely to the advancement of the science of agriculture; but that which is described in his communication to the *Journal of the Royal Agricultural Society* as "a new method of hoeing turnips," has been practised to my knowledge for the last four years, if not for a longer period, by Mr. Fielder King, of Buriton-place, near Petersfield, one of the most accomplished practical agriculturists of the time. I do not mention this to derogate from Mr. Pusey's merit; on the contrary, I think the thanks of the public are eminently due to him for making the plan generally known through the public press, but simply to claim the merit of the discovery for the person to whom it really belongs. As an old subscriber of many years' standing to your valuable and independent paper, I venture to request the insertion of this communication.—I am, sir, yours, &c.,

September 3, 1852. VERAX.

ON THE DISEASES OF PLANTS.

There is not a subject in farming more unaccountable, more perplexing, or more difficult to encounter, than the diseases of plants. The ailments to which animals are liable are difficult enough to manage, and often baffle the utmost efforts of science and skill; but the diseases of plants seem to be of a nature to baffle all the efforts of the scientific, and to run their race of destruction almost untouched by any effort of man. Who, for instance, can arrest one atom of the potato disease? Nay, who can, as yet, account for its cause? All attempts at cure are little better than empirical. Who knows either the cause or cure of clover-sickness? of aubury? of mildew? of smut?

All we really know is this: That plants are, the more we grow them, and the greater the produce of them, more and more liable to disease. We ought to become, the longer we cultivate, better acquainted with their habits, their wants, and their security; but we seem to be, the more we cultivate, carried further and further from success in producing them.

The principle is one somewhat difficult to understand, to those who have narrow views of the operations of nature; but to those who look at things more as they are, it is a part of a great plan—a link in the chain of causation, perfectly explicable.

Look at a crowded city. It is always a conglomeration of disease and death. Sanitary measures may do much; but the rate of mortality—the liability to disease—will always be greater. The lives of individuals seem to be impaired by being absorbed by the mass around them. It is true of all crowds. In our prisons, our hospitals, our penitentiaries, a disease, trifling in an isolated home, may become dangerous—may run into epidemic; and so our high *cultivation*—our crowding of fat and luxuriant plants—*renders them liable to disease.*

We hardly know a plant which has not manifestly shown that it is subject to this mysterious law. The potato, however, seems to be a case in point the most striking. It is, by cultivation, carried away from its natural wildness until it becomes almost another kind of plant. In its native country—Peru—it is found not more than three inches high, with large flowers, and tubers the size of a hazel-nut. Now, by cultivation, the flowers become insignificant; the stem increases in size, in some instances, to the length of five or six feet; the tubers enlarged to a weight, in some cases, as much as three or four pounds; and instead of one straggling plant here and there, thousands of acres are covered with the plant, to the exclusion of almost every other. Nature revolts at this over-peopling with rank potatoes. Some weakness of the plant, some atmospheric cause, dissolves the vital power which holds the chemical particles together; and we have dissolution and decay irremediable.

Take the vine again, carried by man from its natural wildness—clustered together by fields, nay by forests—excited by manure, protected by glass, pruned by science, for centuries, so as to increase the juicy fruit for nearly six times; it shows revolt at this forcing, and a vast disease has destroyed the fruit, and threatens to be the death of the vines themselves. It is the cholera of the crowded vinery, as much as that plague ever visited Hull, or Leeds, or London.

A more slow and tedious, but not less active disease, is eating out the red clover. It will but attack the plant as such wherever it may be found, as is the case with the potato and the vine; but it will be the death of it in the locality where its consequence has too rapidly preceded it, and the land refusing to mature it is said to be clover-sick. But when the question comes to be asked what constitutes that peculiarity, all explanation ceases. We cannot tell death has been there, and there is no living for any succeeding race for several generations. We know not whether it is starvation or infection—but such is the fact.

A similar disease is now very prevalent in turnips. On the best turnip soils—with the highest of farming, and with plants absolutely the most promising—a flag in the leaves is discerned some

sunny day, and by-and-bye the plants wither and die; they are a mass first of thickened and carbuncled roots, and then an accumulation of disgusting corruption, while weeds — seeming to triumph over this death of the race which had displaced them—seem to run riot on the death of the turnip. Here, again, we are at sea. No one has yet demonstrated whether it is an insect which causes the clubbing, or it is the decay produced by the insect which forms a favourable nidus to the insects. Now, what we have to urge is this: Let all investigations be carried on in a large spirit, not looking merely at a particular crop attacked with a peculiar disease, but inquire if all our cultivated crops are not more liable to some disease than they were, and above all if general *mildew* is not more prevalent in all our crops than formerly. Whether it is a cause or effect we know not, but we mean that this spirit should animate those who seek for information. Large views of nature and of climatic and atmospheric influences should be brought to bear on the subject.

We will not either assert or contradict the somewhat plausible theory that excited electricity by our machinery—on railroads and on telegraphs—are amongst the causes of this change. It may be owing to a great accumulation of causes; but we are satisfied it is one of the drawbacks of high cultivation, and we are not sure that more is not due to this than to any other cause for the alarming prevalence in our days of diseases in plants.—Gardeners' and Farmers' Journal.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

THE SOUTHERN AND WESTERN COUNTIES.

Letter XXIX.

(From the Morning Chronicle.)

Having disposed of the counties of Somerset, Devon, Cornwall, and Dorset, I proceed to give some account of the state and prospects of the labourer in Hampshire, Surrey, Sussex, and Kent. In doing so I shall first describe him as I found him in various parts of Hampshire, and in the western division of Sussex. I take these two together, because the prevailing industry in both is the same—farming, in its ordinary acceptation, being carried on, to the almost total exclusion of other kinds of rural employment, throughout the whole of the one county and the western moiety of the other. It is true that in some portions of Hampshire (as the neighbourhood of Petersfield), hop-gardens are to be met with; but, taking the county generally, the cultivation of the hop is rare and exceptional. It is far more general in the county of Surrey, whilst in East Sussex, and throughout almost the whole of Kent, it is carried to such an extent as to exercise a material influence over labour and the general condition of the labourer. For the present, therefore, I shall confine myself to the portion of the district comprised by the four counties in which farming, in the usual sense, is almost exclusively carried on.

The south-eastern section of Hampshire, comprising somewhat more than one-fifth of its whole area, is almost as isolated from the main body of the county as is the Isle of Wight itself. On the east and south it has Southampton Water, the Solent, and Christchurch Bay; whilst to the west it abuts upon Dorset, and to the north upon the south-eastern angle of the county of Wilts. Between the upper end of Southampton Water and the Wiltshire line is a narrow strip of land, by which alone the district has a direct connexion with the main body of the county.

This part of Hampshire is chiefly famous from so large a portion of its surface being occupied by what is known as the New Forest. The wild and picturesque tract thus designated, so long a royal domain, occupies almost the whole of the central portion of the district. It is surrounded on nearly all sides by a belt of cultivated or cultivable land, which separates it from Wilts and Dorset, and which interposes, except at a very few points, between it and Southampton Water, the Solent, and the Channel. Throughout the whole of this cultivated belt—but particularly the portion of it stretching to the south of the Forest, from Boldre Church to Lymington, and thence to Christchurch, and to the west of it, from Christchurch to Ringwood, and thence on to Fordingbridge—the condition of the farm-labourer is, in almost all respects, similar to what I have already described it as being in the adjoining counties of Dorset and Wilts. Between Lymington and Boldre, which is the south-eastern angle of the Forest, the land is good, and in parts highly cultivated. The labouring population is, therefore, denser in that direction in proportion to the surface than it is immediately to the west of Lymington, between which and Christchurch there is a good deal of high down-land. In places in which this high down-land stretches back any distance from the sea, large tracts may be seen without the faintest trace of a human habitation upon them. The coast is high, cold, and shelterless, vegetation along it struggling in many places very hard for an existence. The trees, when they are to be met with, are all bent inwards at a considerable angle from the perpendicular; their branches stretch inland from the sea, whilst at top they are cut smoothly off by the keen wind, as if a huge scythe had been swept over them, at elevations varying according to their distance from the shore. Proceeding inland, the cold, cheerless, and naked downs merge

gradually into the vast heathy tracks of the Forest, with patches of land in a state of tolerable cultivation sometimes dividing them from each other. On these, and on the borders of the heath, humble tenements may be seen at somewhat long intervals. The county improves, and population increases in density, as you approach Christchurch — from which, up to Ringwood and Fordingbridge, stretches a narrow belt of land, about twelve miles in length (and separating the Forest from Dorset), the greater portion of the surface of which is in a state of comparatively high cultivation. Taking the whole of the portion of Hampshire now under consideration, it is along this last-mentioned belt that population is to be found pressing in the greatest numbers upon the area. In 1841 the Ringwood division of the county, with an area of about 67,000 acres, and comprising, amongst other districts, the hundreds of Christchurch and Fordingbridge, had a population of upwards of 18,500 souls, being about one for every 3¾ acres. The population of the Lymington division was, at the same time, only about 11,500 to an area of 80,000 acres, being about one person to every 7 acres, or a little more than one-half the population of the other division. The population of the Petersfield division, which lies inland on the eastern side of the county, and is tolerably well cultivated throughout, was only about 10,600 to an area of about 62,000 acres, or about one person to every six acres—or from 30 to 40 per cent. lower, in proportion to the surface, than that of the Ringwood division. The disparity between the Ringwood and Lymington divisions is easily accounted for by the extent of the latter, which lies waste and unproductive; but it is not so easy to explain that existing in this respect between the Ringwood and Petersfield divisions—seeing that, in both cases, the greater portion of the surface is occupied and cultivated in one way or other. But whatever may be the reason for this disproportion, the fact is that it is as great now as it was in 1841. No one can traverse the tract of land of which Ringwood is longitudinally the centre, without being struck by the extent to which it is pressed upon by population. Most of the county districts, taking them separately, are considerably below the average ratio of population to surface throughout all England, comprehending, of course, the entire population—that of the towns, as well as that of the rural districts. But the Ringwood division of Hampshire comes, in this respect, within a fraction of the average rate. The disparity between the Ringwood and the other divisions is, if anything, greater now than it was in 1841; for both the latter districts have received more relief from emigration than the Ringwood one.

As may be supposed, so comparatively dense a population, in a district almost exclusively agricultural, will furnish a very large proportion of cases of casual and permanent distress. It is in the hundred of Fordingbridge that that distress is, perhaps, seen most constantly and to the greatest extent. In 1842 the amount of poor-rates levied in the Fordingbridge division of the hundred very nearly equalled one-third of the whole assessed value of its property. In Lymington, during the same year, the poor-rates did not amount to one-seventh of the assessed value of property; whilst, although they fell rather heavily upon the town of Petersfield itself, the ratio in the hundred in which it is situated did not much exceed one-tenth of the assessed value of the property. In Ringwood, on the other hand, within the same division as Fordingbridge, they exceeded one-sixth of the declared value of the property assessed. The same relative proportion, as regards rates, is still kept up between these places. There is a larger actual amount of employment given in the Ringwood division than in the others; but not so much as in them, in proportion to the numbers to be employed. Hence the comparative weight with which the rates fall upon that division. The great bulk of the land is brought under cultivation, between Dorset and the Forest, and between the border of Wilts and the Channel, but much of it is appropriated to the purposes of dairy farming, which gives rise to far less employment than tillage does. A dairy farm of considerable extent can be managed by a man and his family without any extra aid; whereas, to get crops from an ordinary farm, even of small size, it is in ninety-nine cases out of a hundred necessary to call in the aid of hired labour. It is true that there are but few dairy farms so economically managed; but, as a general rule, the more land is laid out in dairy farms the smaller is the population of the district, or the greater the number of paupers. In districts, indeed, where dairy farming has been long pursued, as in portions of Buckinghamshire, Berkshire, Oxfordshire, Somerset, and Devon, the relative proportion of paupers to population is not greater than elsewhere, because the effect of such a system has been to keep down population. But in places in which arable farms have recently been turned into dairy farms, the proportion of paupers to population is generally found to be larger than elsewhere, inasmuch as time has not yet been given to the system to develop its necessary tendency towards the diminution of population. This is the case in some parts of the counties just named, and in many parts of Wilts and Dorset. It is also the case, to some extent, in the portion of Hampshire now under consideration. Here and there arable land has been resolved into grass farms for the feeding of cattle, with a view to dairy produce. Wherever this has been done many labourers have been thrown out of employment, and the wages of those continued at work have been reduced. In other cases in which the change has not yet been made, it is talked of, and wages have been reduced in anticipation. Many farmers complain that they cannot go on at present prices, without a reduction either of rents or wages. A reduction of rent is what most of them look to as most likely to immediately benefit them; but this being more difficult to secure than the diminution of wages, which is a course more in their own power, they resort to the latter at once.

Whilst in conversation with one of them, in Dorset, in reference to this subject, he informed me that he had paid away about 500*l.* a year in the shape of wages. He had been lately reducing the wages of his men to the extent of about a shilling a week each. On making a calculation of the savings which this

would secure to him in the course of a year, I found that it would amount to about 35*l.* I asked him if he expected to be able, with 35*l.* to meet the exigencies of his position? "What can I do?" he asked, "I can't get a reduction of rent." "I'll tell you what I'll do," he continued, "if I can manage it; I shall make an arrangement to let my farm go to grass. Dairy farming costs less money, and is likely to be the most profitable going." "How does it cost less money?" I inquired. "It employs fewer hands," he answered. "But the hands are with you, and you must feed them," I suggested. "That's true," he replied; "but the more of them there's out of work, the more likely it is that we'll get them emigrated." This is the direction in which, at this moment, the minds of many farmers are being bent, not only in Hampshire but also in the interior of Dorset, where land is at present extensively tilled. They would like, in the first place, a reduction of rent, of from 20 to 25 per cent. When they find they cannot have that, they next press upon the labourer, and seeing that they have but little margin for reduction in that quarter, they look to a new system of disposing of the land, which will require less labour and outlay in maintaining it. It is thus that, in the west of Hampshire, as elsewhere, even where they have not made actual preparation for converting their arable into dairy farms, they have already reduced wages, and talk of eventually having resort to such a course.

As may be inferred, therefore, wages are, in this part of Hampshire, but the counter part of what they are in Dorset. Seven shillings a week I found to be about the maximum rate paid to the ordinary day labourer. Carters have 8s., and sometimes, but very rarely, 9s. And when I say that 7s. a week is about the maximum paid to the ordinary labourer, I mean the labourer steadily employed. The employment of many of them is of the most precarious description, and it is only some of them that are paid, whilst they are at work, even at the rate of 7s. a week. I met a labourer near Fordingbridge, who told me that he had had but three days' work during the previous week, at 1s. 2d. a day, or at the rate of 7s. per week. Thus his earnings for the week were but 3s. 6d., and he had four children to support, house rent to pay, and fuel to purchase. His existence at all was a mystery to himself. He could not tell me how he got along, nor could anybody else do so; and so it is with the great bulk of his class. How they manage to eke out an existence is a puzzle to everybody, and everybody will frankly tell you so. Nothing could more forcibly show that there is somewhere something very seriously wrong, than the fact that one class of society is thus at a loss to account satisfactorily for the mode in which another class manages to exist. Nor is the man who is only occasionally employed always so fortunate as to be paid at the same rate per day as the man steadily employed. To numbers who have casual work by the day, only 1s. a day is paid, being at the rate of 6s. a week. These are generally, however, such as are not deemed able-bodied, or capable of a full day's work. But still both they and their families are capable of consuming the same quantity of food as before, and the amount of privation suffered by those so circumstanced is shocking to witness. Besides, there is no one to decide who is and who is not able-bodied; and many are put upon the incompetent list at 6s. a week, who appear to be quite as capable of going through a day's labour as others receiving more constant work and higher pay. Nor is it always that the lowest rate is confined to such as are declared not able-bodied. When the numbers of the labourers are considerable in a district, the farmers frequently take advantage of their being so to lower the wages of those who are indisputably able to perform a good day's work. Thus I have seen young and athletic men labouring for 1s. per day, who were compelled to accept that rate by being told that if they did not do so, there were others that would. "Do you give your employer more than 6s. worth a week of the work that is in you?" I inquired of one of them thus circumstanced. "I'm sure I don't, and fool would I be if I did," was the answer. Here, after all, is the mistake. Nominally cheap labour, in the case of able-bodied men, is not the cheapest labour that a farmer can employ. Unless he exercises the most stringent supervision over his workmen, and keeps them constantly at their work, it is impossible for him to get a full week's work out of them for 6s. Indeed, it is questionable if he gets even the value of his 6s. Lord Fortescue was led to conclude, by experience, at Southmolton, that labour at 12s. a week was, in the end, more profitable to him than labour at 8s. The hiring of the best available labour, at a comparatively high rate, is almost invariably the example set by those who boldly embark upon a system of improved and efficient cultivation. It is the course adopted by the Rev. Mr. Huxtable, in Dorset. He hires no man simply because he is a dweller in the parish, and because, if not employed, he may be thrown upon the rates, but because he is a good workman—and being so, he is hired at good wages. The wages paid by Mr. Huxtable are considerable higher than those paid around him, yet there is reason to believe that his is in reality the cheapest labour in the neighbourhood.

The diet of the labourers in this part of Hampshire is as low as their scale of wages would lead one to expect. Its staple consists of bread, cabbage, and turnips. As a general thing, butcher-meat is out of the question. The failure of the potatoes has been severely felt throughout the district. Those immediately on the borders of the Forest are, for obvious reasons, better off, as regards diet, than those living nearer the Dorsetshire line—having sometimes considerable quantities of venison carefully stowed away in their larders. Fortunately for them all, provisions are cheap; but for which, they say, there would be no living in these times. In many parts, throughout this district, the 4lbs. "seconds" loaf was selling for 5d.

Having one market day been informed by a farmer at Wareham that he could scarcely dispose of his wheat at 1d. a pound, or about 5s. per bushel, I was curious to know how the 4lb. loaf could be sold, as it was in some cases, for 4½d. The additional halfpenny seemed to constitute the sole margin for the expense of grinding the wheat, for the payment of the baker's labour, and for his profits. On inquiry, however, I discovered that this margin was somewhat greater than I had supposed it to be, inasmuch as a 4lb. loaf can be made out of little

more than 3lbs. of flour. But with wheat at 1d. per lb., 3lbs. of flour must cost more than 3d. There is then the cost of the yeast to be taken into account, and the outlay of the baker, in the shape of labour, fuel, and rent. In addition to this, it must be borne in mind that the whole of the wheat does not enter into what is called "seconds" flour —a portion of it being throw aside in the process of grinding for other purposes, which are in general not very profitable. The margin is, therefore, still small on which the baker has to fall back for his profits. At Blandford, where the price of wheat and of bread was about the same as at Wareham, I inquired more particularly into this, and found that it was only to the union that the bread was sold at the rate of 4½d. a loaf. To private customers in this town the "seconds" loaf was charged 5d. The baker who informed me of the exact state of the case had himself but recently fulfilled a contract for the supply of the workhouse at 4½d. a loaf. He told me that he paid 28s. a sack for his flour, and sold it it to the union for 30s. in the shape of bread, having thus but 2s. per sack wherewith to cover his expenses and realise a profit. "Did you realise a profit?" I asked. "No, sir," said he, "I did'nt cover my expenses." Then you would not take such a contract again?" I suggested. "I should be very sorry to do so," he replied; "and no one can take it without loss if he acts honestly by the union." "Is the union now supplied at that rate?" I then asked. "I believe it is," replied he.

As regards house accommodation, the poor throughout the Ringwood division are rather badly off. In the Lymington division their condition in this respect is superior to what it is in that of Ringwood. In 1841, when the population of the Lymington division was 11,478 persons, the number of inhabited houses which it contained was 2,295. This gave almost exactly one house for every five persons. There were at the same time, in the division, twenty-five new houses in process of erection. In the Ringwood division the proportion was about one house for every six persons. Notwithstanding this, there were at that time but thirty-eight new houses being built throughout the whole district. Nor have things in this respect improved since the last census was taken. Since that time influences have been at work, which did not then exist to the same extent as now, to cause the disappearance instead of the erection of cottages. In the town of Ringwood and its immediate vicinity the pressure is not so great, rents being there tolerably moderate, and the houses, although some of them are inconveniently crowded, not being generally so. But in the outlying hamlets, particularly around Fordingbridge, and between Ringwood and Christchurch, cases of this kind, quite as had, and attended with as pernicious results as any in Dorsetshire, came too frequently under my observation; indeed, the characteristic of the whole district is the pressure of population, both upon surface and upon house accommodation.

From the district in question I passed directly into the New Forest.

It is not my purpose here to enter into any of the political questions connected with this royal domain. And it is well that these matters are foreign to my present inquiry, for the means of obtaining information respecting the management and condition of the Forest are by no means facile or abundant. Those connected with it—that is to say, those who live both in and upon it—are extremely jealous of anything assuming the form of inquiry concerning it. It is astonishing, when you ask them a question, how utterly ignorant they are of the subject to which it pertains. No one seems to know anything of what is going on in the Forest, whilst some meet your inquiries in a manner which might lead you, if not on your guard, to infer that they were entirely ignorant of its very existence. Others, again, will affect a very warm sympathy with your object, and, deeply regretting their own inability to furnish you with the information required, will politely refer you to some one else, who, they assure you, will be as delighted as he is competent to answer any questions which you may put to him. Now, in many cases, the very existence of the party to whom you are thus referred is highly problematical—whilst, on consulting your map to ascertain the position of the point to which you are directed in order to find him, you generally discover it to be at one of the remotest extremities of the forest. It fortunately requires but little experience to put one on his guard against such practices, for if it were not so a man might be sent for a whole twelvemonth on a series of wild-goose chases, and emerge after that time from the Forest quite as wise as he was when he entered it. Most of those living in and upon it treat you as if they felt that their position was equivocal, and that the slightest inquiry tended to endanger it. This being the prevailing feeling, different parties have, of course, different modes of expressing it. Some receive you with a courtesy formal and conventional, but nothing more. Others again get rid of you by referring you, as already stated, to real or imaginary parties at a distance—whilst there are others who know not how to disguise their real feelings. These last are, generally speaking, the foresters of the rougher sort, many of whom assisted, some time ago, in burning in effigy Major Freeman, the Government Commissioner; and to do them justice, some of them looked as if they longed for a decent pretext for performing the same kind office for your Correspondent *in propriâ personâ*—so jealous are they, one and all, of anything savouring of investigation.

My main object being to ascertain the physical condition of the lower class of foresters, I soon found that my best plan was to take counsel of no one, but to traverse the district and observe for myself. In doing so, I wandered over it from Fordingbridge to Minstead, and thence to Burley, near Ringwood—from Burley down towards Christchurch, and thence east to Lymington—from Lymington towards Boldre and Beaulieu—from Beaulieu to Brockenhurst—and from Brockenhurst, by Lyndhurst, back to Minstead again. I thus took, as it were, the entire circuit of the forest; whilst, from Beaulieu through Brockenhurst and Lyndhurst, my route led me almost through the centre of it. The whole district presents to the tourist, in traversing it, a succession of landscapes, which

particularly in summer, when the forest is in leaf—are as greatly varied as they are strikingly picturesque. Now the road wanders over long stretches of heath, here covering tracts of rich and generous land, and there cold and intractable soils. Then it plunges into the thick wood, through which it leads—sometimes in straight and sometimes in winding lines—amidst gnarled and hoary oaks, whose branches overhang you as you pass. From the wood it emerges again upon the open space, covered as before with heath, or short grass, or both—to plunge into the wood again, or into the copse, the young wood of which may yet flourish for centuries, after the older denizens of the forest have disappeared. Thus alternating from wood to open space—with numerous roads, sometimes very indifferent in their character, intersecting it in all directions, and with here and there a primitive-looking little town, village, or hamlet—the forest presents itself in a rapid succession of wavy undulations, calculated alike to charm the eye and stimulate the fancy. In some places it is so wild and lonely that it appears to be part and parcel of that domain

"Which mortal foot hath ne'er or rarely trod;"

and in traversing these one would be in no hurry to attribute it to a trick of the imagination if he thought he saw a troop of satyrs in their more sequestered glades. The traveller would feel quite as easy in the presence of them in one of these lonely nooks, as in that of a troop of foresters, some of whom are rather uncouth and unprepossessing when suddenly encountered so far from the haunts of civilized men, and, as it were, in the very depths of nature. The beauties of the forest seem to culminate in the vicinity of Stony Cross, where William Rufus was mistaken for a stag.

In its moral aspect, the New Forest is about as wild, without being as attractive, as it is in its physical features. The population included in what may be regarded as the circumference of the forest is considerably greater than that of what is, strictly speaking, the forest itself. Large encroachments have from time to time been made upon this public domain, its surface being more or less interspersed with numerous patches of cultivated land, in the hands of private individuals. These patches vary very much in size—from a very few acres to thousands in extent. Some of those in possession of these encroachments occupy the position of large landed proprietors, whilst others are like so many squatters on small patches of land, which they cultivate either exclusively themselves, or with the aid of very little hired labour. The possessors of the larger encroachments are very bold in the assertion of their rights, and maintain that, if a thorough adjustment of conflicting claims were to be come to, the Crown would lose at least two-thirds of what it now possesses in the district. Yet, like the more insignificant encroachers, they are not ambitious of courting inquiry, nor are they in any hurry to push matters to an issue. The whole space which can alone be now, strictly speaking, regarded as the forest, comprises from sixty to seventy thousand acres. The encroachments in some places, such as the large one at Minstead, project into it from the circumference; whilst in others they are dotted over its surface in isolated patches. As they are generally more or less cultivated, it follows that the population of the forest comprises, in addition to those strictly termed foresters, a small class of agricultural labourers. On the larger encroachments these are tolerably numerous; on the smaller ones, they are the squatters themselves, together with such persons as they employ to cultivate the land with them. The class strictly termed foresters are those in the employment of the Woods and Forests, this body frequently comprising some of the smaller class of encroachers. Those who are field labourers in and about the forest are but little better paid than the labourers around them; but the foresters are much better paid, many of them receiving from 13s. to 15s. a week, and some even more. They have frequently, however, to walk very far to get at their work. The general condition of the foresters and of those about them is very much influenced by the extent to which they take advantage of what are termed forest rights. These sometimes resolve themselves into rights of common, for the pasturage of cattle, and at others, it is to be feared, into killing deer for the supply of the larder. It is almost impossible to conceive that the deer, with which the forest abounds, were safe, when timber was being purloined to the extent of £5,000 worth a year. And, although the keepers are numerous, and the look-out more vigilant now than formerly, it is by no means probable that the deer are yet treated by the foresters as things sacred, on which it would be sacrilege to lay hands. Indeed, that they are not so is evident from the fact that, in some of the towns within and on the borders of the forest, there are parties who can procure you venison, to order, like mutton. In this way the foresters, as a body, manage to fare better than the poorer classes elsewhere. If they have not more butcher-meat than the poor have elsewhere, they are not altogether destitute of animal food. Their command of fuel is also better than that of the farm labourer, whilst their houses are, in the main, warm, comfortable, and tolerably roomy. They generally build them themselves, the fabric being constructed in most cases of mud, or of that composition of sand and clay which, when other circumstances are favourable, is by no means a bad material wherewith to build. I found some houses rather inconveniently crowded, both in Brockenhurst and Lyndhurst; but in general, as compared with the labourers' houses elsewhere, overcrowding is not the fault of those within the forest.

From these considerations, taken in connection with their higher scale of wages, it is obvious that in point of physical condition the forester is considerably in advance of the farm labourer. In using the term forester here, I include those who work in the forest in the cultivation of the soil (wherever it is cultivated), inasmuch as they partake, more or less, of the comforts at the command of the foresters more strictly so-called. The life led by the denizens of the forest is, on the whole, rather a lawless one, and a somewhat lax morality pervades the entire region. Indeed, it can scarcely be otherwise—general demoralization being the necessary charac-

teristic of a community a large proportion of whom are systematically engaged in poaching. It is seldom, however, that they will molest a wayfarer, meet him where or when they will. I have more than once been benighted in some of the most lonely spots of the forest, when I have met them prowling about in twos and threes. On one occasion one of them remarked, whilst passing me, "I wouldn't like to be travelling alone through the forest at such an hour:" but with this exception, they have generally passed me with a simple "good night." So far as I could manage to hold any intercourse with them, I found a degree of ignorance prevailing amongst them which indicated but too plainly that, whoever else may have traversed it, the schoolmaster has not as yet taken very extensive walks through the forest.

From the forest I proceeded to Southampton, and thence to Winchester and Basingstoke. This led me through the central region of the county—a district almost exclusively agricultural. It is to the north-east of Basingstoke that the country assumes that aspect of wild sterility which characterizes so large a portion of the weald of Surrey, of which this tract of Hampshire is but a prolongation. From Basingstoke to Southampton is one stretch of almost unbroken cultivation, the whole district between these two extremes being almost exclusively a farming one. The hop districts of Hampshire, which are small and not very numerous, are generally found near the eastern line of the county. The condition of the farm labourer in the districts in question may be taken as the type of his condition throughout the entire county. In the immediate vicinity of Southampton and Winchester—as in that of all tolerably active markets—the wages paid are somewhat in advance of those received in the circumjacent parishes; but throughout the whole of this central division of the county, 8s. a week is the highest average of wages—including the higher rates paid here, as elsewhere, to carters and others in employments more or less confidential. Numbers are in receipt of only 7s. a week, and many who were not considered altogether equal to a day's work, I found toiling from daylight to sunset for 1s. a day. Sometimes you find a labourer with a house free; but this is the exception, not the rule. Near the waste, to the north-east of this district, they are a little better off, having some privileges which are not enjoyed by those living in the more arable tracts. As regards their dwellings, they are better provided in point of room than the labourers in some of the counties further to the west. In connection with the last census, this portion of Hampshire was divided into the three districts of Basingstoke, Winchester, and Southampton. It then appeared that, in point of room, the labourers were best off in the Basingstoke division, and worst in that of Southampton; but even in the latter the average number of people to each house did not exceed six. In too many cases, however, the tenements themselves are of a most miserable description. The worst I met with were in some of the parishes between Basingstoke and Winchester. In the neighbourhood of the latter town they are tolerably good.

From Winchester I passed to the eastern borders of the county, by Bramdean and Petersfield. For fully half the way to Bramdean the road is flanked on either side by successive sweeps of down. This tract is consequently very thinly peopled, nor are the traces of human habitations visible but at long intervals. Indeed, the only living things apparently inhabiting it are the rabbits, which swarm upon the estates of Lord Northesk. From the high land you at length rapidly descend upon a more sheltered and cultivated tract. This continues on to Bramdean, and thence through an undulating and picturesque region to Petersfield, from which it also stretches, with but little intermission, for two or three miles more, to the borders of Sussex. Here population again becomes scarce, and the farm labourer is to be found, as before, in his village, his hamlet, and his isolated hut, but with no perceptible change for the better in his condition. Seven shillings a week is again the average of his earnings; nor is it always that his rate is paid for a full day's work, the pernicious practice prevailing here of making a distinction between married and single men. The consequence is, that many single men, who do not choose to be under-paid for their labour, take to poaching, instead of to regular employment.

From Petersfield I entered West Sussex, by way of Rogate and Midhurst, and shortly afterwards proceeded to Petworth. From the Hampshire line, all the way to Petworth, the country is, with but few exceptions, highly cultivated. The chief proprietors of the neighbourhood are Lord Egmont and Colonel Wyndham, the seat of the former being near Midhurst, that of the latter close to Petworth. In the immediate vicinity of both seats the labourers are comparatively well off, both proprietors finding a good deal of work for the labourers about their respective parks and mansions, and paying them somewhat higher than the farmers in the neighbourhood. Lord Egmont, I was informed, pays most of his labourers who are engaged in operations connected with the soil from 8s. to 9s. a-week. Colonel Wyndham pays them about the same. But the ruling rates around them are lower than this. From 7s. to 8s. a week is all that the farm labourer is receiving who is in the employment of the farmer. Some get 8s., but most only 7s.

The farmers say they cannot pay more, and many of them talk of giving up their farms, as they say it is impossible for them to go on at present prices, with swarms of game to support in addition. A few, I was told, had surrendered their farms, assigning as their reason the insupportable burden of the game. The proprietors in this neighbourhood are game preservers on the most extensive scale; and on all hands you hear complaints of the mischief done by the game, except from the poacher and those whom he supplies. "We have a rare lot of poachers here," said a labourer to me, whilst speaking to him on the subject, "and the more keepers they put on, the more poachers get about." "Do they catch them often?" I asked. "They're keen old fellows, some of them," said he; "but they do get catched sometimes." "And what is done with them?" I enquired. "Oh! they get about three months in Petworth gaol," said he. "Does that do them any

good?" "No; they come out worse than ever." Lord Egmont gave compensation to some of his farmers for the mischief done by the game, but still there are great complaints. The game preservers in this neighbourhood have been much scandalized, I am told, at the proceedings taken by Mr. Cobden, who has purchased a small property near Midhurst. He has two or three tenants, to whom he has given unlimited license to kill the game upon their farms. Throughout the whole district the able-bodied labourers are almost all kept employed, but it is apprehended that many even of these will be denizens of the workhouse before next spring. In some cases the able-bodied have only been kept at work by their consenting to take 6s. a-week. Such is the result of the competition for employment in a densely-populated district. In numerous instances throughout the line from Petersfield to Petworth, the houses occupied by the labourers are of the most squalid and miserable character. The characteristic of all of them is that they are over-crowded. Emigration has been actively promoted from this district; but notwithstanding this, the population has greatly increased, and, as I was informed, it presses now much more upon the house accommodation of the district than in 1841. The few houses on Mr. Cobden's property, when he purchased it, may be taken as the type, in this respect, of the labourers' dwellings in this part of Sussex. He is building new cottages, however, with a view to giving his labourers more roomy and wholesome dwellings. When the approach of the cholera was feared, something was done in the neighbourhood of Petworth, to mitigate, if not altogether to avoid, both the danger and the inconvenience of over-crowded dwellings. The labourers on many parts of Colonel Wyndham's property are now in a much better position, as regards their dwellings, than they were some time ago. Formerly they rented the cottages of the farmers, to whom they paid high rents, and who generally took from them the fruit which grew in the little gardens appended to their dwellings. In many cases the proprietor has taken these cottages into his own hands, letting them to the labourers for about half the rent formerly paid for them, and giving them the fruit into the bargain.

That which I have stated respecting the labourer in the neighbourhoods of Midhurst and Petworth may be taken as illustrative of his condition throughout the greater part of West Sussex. As you find him in the district stretching from Petersfield to Petworth, so do you find him in that lying between the latter place and Arundel, and thence on to Brighton. As elsewhere, you see him in some cases with steady work, in others with only casual employment, but in all with low wages. Owing to the cheapness of provisions, he nevertheless manages to live better now than he used to do when his wages were a little higher, and when even the potatoes were far more plentiful than now. But his staple diet, like that of the labourers in Dorset, is bread and vegetables. It is rare indeed to find either him or his family partaking of animal food. "I have known some of them," said a farmer to me, "who hav'n't tasted meat for the last six months." On questioning him, I found that by this he meant, that although "once in a way" they might get a bit of "broken meat" from those employing them, animal food had not appeared upon their tables, as a regular part of the family diet, for the length of time specified. I happen to have by me several dietary tables of different unions in the west, which furnish a very striking contrast to the labourer's diet in Sussex. In the Liskeard union, I find the inmates of the workhouse receiving bread and milk every morning for breakfast—the men seven, and the women six ounces of bread. In the Penzance union they have the same—both men and women getting seven ounces of bread; and in that of St. Germans the same, but with a scantier allowance of bread to the men, who have only six ounces. For dinner, in the Liskeard union, they have animal food three times a week, viz., on Sunday, when they have, men and women, four ounces of boiled meat, with one pound of potatoes each; on Tuesday, two ounces of boiled meat each, with a pound and a half of potato stew, which is prepared and enriched with meat; and on Friday, three ounces of boiled pork or bacon, with one pound of potatoes. On the Thursday they have fish—pilchards, no doubt—and 1lb. of potatoes. On the intermediate days they have bread and broth, and bread and pea-soup. In the Penzance union, they have meat on Sunday and Wednesday, with 8 oz. of vegetables, and 5 oz. of bread. On Tuesday they have fish, with 8 oz. of bread. On other days they have bread and meat soup, bread and pea-soup, and bread with rice and milk; and on one, Friday, they have vegetables, bread, and meat soup. In the St. Germans union, they have meat twice, and fish twice a week, with very substantial potato stew three times a week. For supper they have, in the Liskeard union, bread and cheese three times a week, bread and suet broth twice, and bread and gruel twice. In that of Penzance, they have 7 oz. of bread, with milk gruel, every day of the week; and in that of St. Germans, bread with rice milk five times, and bread and meat broth twice a week. But it may be said that, as the diet in the workhouse has, as regards its quantity and character, some reference to that of the labour out of doors, that in the Cornish unions is comparatively high, as in the physical condition of a tolerably large class of the labourers in Cornwall, for reasons stated by me when treating of the subject of labour and the poor in that county. Let us, however, come nearer home, and compare with the diet of the independent labourer in Hampshire or Sussex, that of a workhouse situated in a district in which the condition of the labourer is analogous to his own. In the Wareham workhouse I found bread and gruel the fare every day for breakfast—the men getting seven and the women five ounces of bread. For dinner the inmates have animal food—four ounces each when it is meat, and three ounces when it is bacon, with a pound and a half of potatoes and other vegetables, three days in the week; for three more they have bread and soup, and on Sunday they dine on suet or rice pudding, of which the men get fourteen and the women twelve ounces. For supper, they have bread and cheese every night in the week. As already stated, the staple diet of the independent labourer and his family is bread,

turnips, parsnips, cabbage, and potatoes. He rarely tastes meat—occasionally tastes cheese—but seldom has a meal of it. What an anomaly is here! And, strange to say, although the union, by purchasing its edibles by contract, can procure them about 20 per cent. cheaper than the independent labourer can, who buys no more than he needs at a time, yet the independent labourer and his family manage to eke out an existence on about one-half that which it takes to support a pauper and his family in the workhouse. The wonder is, that every labourer in the land is not eager to pauperize himself.

ON THE RESOURCES OF THE SOIL.

At a time when the most intense interest is manifested in regard to the measures which are anticipated will, in the approaching session of Parliament, be introduced by the Government, with the object of ameliorating the condition, more especially, of the occupier of the soil, through the re-adjustment of taxation, by some *distributive* mode of raising the necessary revenue to meet our annual liabilities, whereby there may be more of equality experienced, so that the chief burden shall not, as at present, fall upon the broad acres of the kingdom; we cannot but be most anxious for the issue.

Whatever the proposition may be, which may be made as being capable of accomplishing such a *desideratum*, it will be regarded by the greatest anxiety, more especially since the intention of raising a revenue by the re-imposition of a duty on corn has been abandoned by the Earl of Derby.

The country has by its late verdict set that question at rest for ever; and however inclined the advocates for such a mode of raising a revenue may be to question the good sense of the constituency of England in arriving at such a determination, it will be entirely futile, at this time of day, to argue upon the assumption that had a different result followed the late appeal to the country, the remedy provided would have met the grievance under which landlord, tenant, and labourer are suffering at the present period.

The time has gone by for framing an argument on such an antithesis; and it may also be conjectural—with the present liabilities on land—that even a duty of 8s. per qr. on wheat would have been the *panacea* for the existing evil.

Mr. Disraeli is endowed with intuitive ingenuity of the highest order, and he adopts those conclusions only which are based on premises of the most logical acuteness; so that we need be under no concern of the probability of his rejecting the smallest item which may prove valuable in giving strength to his proposition. He may neither be the advocate for a National Poor-rate—the readjustment of the Tithe question—charging the County-rate on the Consolidated Fund—abandoning the unjust Income-tax assessment—reduction of the interest on the Funded Debt—relaxing the operation of the Malt-tax so far as to permit the grower of barley to do what he will with his own—yet we may content ourselves that so acute a financier will find a powerful means of meeting the question in all its varied ramifications.

Yet, notwithstanding this assurance, it becomes neither the owner nor occupier of the soil to wait with folded arms for the extraneous aid he anticipates will follow from legislative enactments; for it is manifest that the country is intently observing whether the above important interests *are using their individual efforts to help themselves* rather than depending altogether on assistance from without.

In the present age, when the utmost stretch of invention is accomplishing so much in the arts and sciences—when mechanical skill is competing in such a variety of multifarious operations—it may be asked, are those who are so *intensely* interested in the above question to stand by and content themselves by pursuing the beaten track of generations gone by? Would it not, rather, be the more rational to treat land as *the raw material*, capable of being so worked as shall return the cultivator a fair *quid pro quo* for all legitimate expenditure, despite the lowness of prices which at the present day rules the averages of agricultural produce?

It is important, in treating the subject under consideration, to leave nothing in abeyance which may be likely to add strength to our argument; and it will occur, in the outset, whether enough of discrimination be ordinarily exercised by the proprietor of land in the selection of a tenant who proposes the occupation of his estate, so that it is manifest there is capital at hand, mental activity, educational acquirement to the extent that the composition of soils is so far understood as would imply a certain amount of chemical knowledge, and that, besides, in a general way he enjoyed those ordinary attributes which may be naturally sought for in one who is desirous of engaging in an undertaking wherein a considerable amount of intelligence is requisite to insure commensurate success. If the landlord be satisfied so far, the question next arising will be—and a most important question it is—what is an equivalent in the shape of rental per acre, *always* taking into consideration *the prices obtainable from the product of the tenant's capital invested, his skill, risk, and proportionate return for industrial labour?* It is to be apprehended that such last-named rule does not prevail, in a general way, at the present period—at least it is stated by occupying tenants (not a few) that the present condition of things is not met by those liberal adjustments which the exigency of the times would justify. The only legitimate mode for the adjustment of rent (presuming that the estate in question were principally arable) would be the average value of corn for three years previously; or, what might be more agreeable to landlord and tenant, the current averages of the past six months.

There are landlords who, from time to time, make *occasional reductions*, or allowances, in the shape of per-centage on the half-year's audit; and, which is, no

doubt, acceptable enough to the tenant: yet, notwithstanding, the principle is absent which should stimulate enterprize, since the occupier can calculate on presumption only, and not on that *fundamental rule* which governs the operations of trade. Let the landlords of England meet the case of their tenants on the broad principle of equity; yet should anything in the shape of difficulty arise between the contracting parties, let a competent individual be selected who shall from acknowledged data assess the yearly value per acre, agreeably to the average which the agricultural price barometer has indicated for the past twelve months. Under existing circumstances, prices cannot materially vary during that period, and hence there will be but slight difficulty in the computation.

In order to insure an enterprising tenant from the caprice of his landlord, it must be always important to the man of capital and skill that his interest on the land he occupies should be protected by lease; so framed, however, *that the average current price of grain should regulate his annual rent;* and, with such precautions, the case of the tenant would then assume as equitable an aspect as the most fastidious claimant for his "right" might advocate.

Next in order comes the tenant himself, to whom we must write so plainly, that "he who runs may read."

Tenant farmers of England, you are to be up and doing! It will not suit the present exigency, for you to assume the stand-still attitude. *Forward!* is the word—and unless you take the initiative, your case is hopeless. You have been told what the landlord's duty is; yet there is a duty which you owe yourselves, which is paramount to it, yet if cast aside, must bring entire ruin on your homesteads. In a general way most of you, now-a-day, have your half-yearly meetings, whereat is discussed a variety of topics in relation to agriculture; and where you have sound practical advice offered you in respect to drainage, manures, tillage, &c., &c., all of which afford matter for panegyric. It is, however, to be feared that what is taught at those meetings is not so commonly acted on as could be desired; inasmuch, that as your fathers did of old so do you, for you still "pitch" by the road-side the precious manure from your farm-yards, which should have been retained at home, rather than that *its most valuable liquid parts* should be suffered to expend themselves by evaporation; or, what is equally bad, run to waste into some contiguous ditch or drain! It is surprising that at the present day this malpractice should prevail, after so much has been said and written on the husbanding of liquid manure. What more simple than the construction of a tank in the farm-yard? Should the cost alarm the tenant, the landlord would no doubt readily incur it, and charge the outlay by easy instalments, from time to time, until payment was made.

It cannot be expected, much less presumed, that the model plan which is practised by Mr. Mechi will be extensively imitated; but, notwithstanding, great facilities may be acquired in respect to the distribution of the liquid material, upon the principle somewhat of the cart for watering the highways.

There can be no doubt much expense would be saved by the non-occasion of cartage, &c.; yet where there is the accustomed staff of labourers and horses on the farm, those appliances may be so adapted as not to interfere with the ordinary run of their daily occupation.

The making grow two blades of grass where one only grew before, is a problem easily solved; and by closely considering the principles which should actuate the cultivator of the soil, the difficulty may be surmounted.

So desirable a result may be in part obtained by careful clearing of the land, so that weeds shall not engage the space which would be otherwise devoted to the cultivated plant; and another all-important matter is that the surface, as well as subsoil, be so thoroughly drained that no superfluous moisture be permitted, or otherwise rushes will, in pasture land, usurp the place of grass, and the cereal crop be effectually impeded in the case of arable husbandry.

The tenant-farmer, in short, must be continually on the watch in contriving for himself, as well as taking advantage of his neighbour's experience.

It is for the good of the community at large—equally with himself—that he should keep pace with the times, or otherwise, he may rest satisfied, he will continue to be distanced by foreign competition. There cannot be the smallest doubt that every improvement which may be within reach must be brought to bear so as to place the English farmer on a par with the continental corn-grower. Notwithstanding, however much the farmer's position shall be improved by anticipated legislative means, he will have to exercise more of mechanical and less of manual labour on his estate; indeed it would seem even now almost compulsory, since the stalwart labourers of England are fast quitting their native soil on foreign emigration, and leaving none other to fill the vacuum occasioned by the withdrawal from our beloved country of that bold peasantry—its best, its chiefest pride.

H. P.

THE EFFECTS OF THE NEW GOLD FIELDS ON AGRICULTURE.

How will the gold fields of California and Australia affect the prices of commodities in general, and of agricultural produce among the rest? Will wheat again rise to 80s. or 120s. the quarter, or will it range for the next twenty years between 40s. and 60s.?

These are questions of great importance to the British farmer; not only from their direct results, but from the use which will be made of them in throwing sand into his eyes, and in staving off the only arrangement which can meet the exigencies of his present position.

An agricultural administration—a protectionist admi-

nistration—is in power. Protection was their bond of union—the basis of their policy. They have no other claim to the Treasury benches. Yet their leaders declare protection to be dead and buried; and the farmers' friends are returning from the funeral with the ill-suppressed glee of undertakers' men going to their feast, or relations of some old lady who have succeeded to the goods and chattels of the dear deceased.

As Downing-street began to open on the "great country party," they endeavoured to persuade the farmers that there was a remedy for agricultural distress—the transfer of local taxation to the consolidated fund—which would answer their purpose quite as well as protection. In other words, the farmers were to be relieved by levying on them, in common with other tax-payers, imposts which are borne at present exclusively by the landlords. Tithes, poor's-rates, church-rates, county-rates, are no part of the cost of production. They are rent charges on the estate. Every prudent farmer ascertains their average amount before he takes land, and offers so much the less rent. If the local taxes were abolished to-morrow they would meet the farmer the next day in the form of increased rent. The only injury he sustains from them is when the average amount is increased during the currency of a lease. These statements have been made so often in this journal, that we should not have deemed it neeessary to repeat them but for the deep root which the opposite opinion has taken in the minds of many of our agricultural friends. As a substitute for this transfer of local taxation to the consolidated fund, we have now a "reduction of the cost of production," with some obscure hints that this is to be effected by a re-adjustment of the general taxation of the country. When it shall be found impossible to fulfil this promise, because the farmers pay no exclusive taxes—some say, but let that pass, that they enjoy exclusive exemptions—they will be taught to fix their hopes on the marvellous riches of the new gold fields, and the advance of prices which they will cause to such an extent, that a Protectionist administration may, with a good conscience, remain in office without making any attempt to reverse the commercial policy of Sir Robert Peel, now designated by the mild term of "mistaken."

This doctrine will meet with the more ready credence, because ever since the resumption of cash payments by the Bank there has been a party with whom a depreciation of the currency has been a favourite remedy for that agricultural distress, respecting which we have heard so much since 1815, under protection as well as under free trade. These currency doctrines have taken some hold on the agricultural class, and they who have adopted them will hail with pleasure that prospect of a natural depreciation of the sovereign, through abundance of gold, which they have no hope of seeing established by Act of Parliament.

Justice to the tenant farmers required that, on the repeal of the protective system, they should have had a permanent abatement of rent, proportionate to the reduction, whatever it is, caused by free trade in the price of agriculturul produce. They had a right to expect it from those landowners who advocated the repeal of the corn laws—they had a greater right to expect it from those who opposed that repeal as fraught with ruin to British agriculture. By some of each party the reduction has been made. Honour to them for making it; though, in so doing, they were acting in accordance with their own interests; for a landlord will rarely gain anything by ruining his tenant. A larger number make no permanent reduction, but give their tenants eleemosynary returns on the audit day, and their good deeds of this kind are trumpeted in the provincial papers like their gifts of blankets to the poor at Christmas, or the dinners which they give to the inmates of the workhouse. This is not the position which the farmer should occupy. Too many landowners, we fear, make no abatement at all; but exact the last farthing of protection rents, under free trade prices. Thus, while the farmers have been waiting five tedious years, first for the restoration of protection, then for the removal of local burthens, and lastly for a reduction of the cost of cultivation by a re-adjustment of general taxation, their capital has been dwindling away in the form of an excess of rent, transferred to the pockets of the landlords. When they now ask for an equitable adjustment of rent, they will be referred by the landlords, as well as by the political farmers' friends, to California and Australia, and the revolution in prices which they are to effect. We propose, therefore, to devote a series of articles to the discussion of the questions whether any considerable rise of prices is to be expected from this cause; and what its effects, should it take place, would be on the condition of the farmer. Collateral to this inquiry there will be the question of the indirect effects of the Australian gold-fields on British agriculture by stimulating emigration, and thereby raising the wages of labour on the one hand, and diminishing the competition for land on the other.

There is no error more prevalent than that of mistaking money for wealth, and high prices for prosperity. The mass of commodities, of implements and machinery, constitute, with other means of employing labour, the *material wealth* of a community. Money, or *metallic wealth*, is only the measure of the value of these commodities with respect to one another; and its amount will always bear a very small proportion to the material wealth of every country. *Value* and *price*, too, are frequently confounded. The value of anything is its power of purchasing other commodities. Its price is the quantity of money which it will purchase. A quarter of wheat will still exchange for two quarters of oats, or a quarter and a-half of barley, whether wheat sell for 40s. or 80s., oats for 20s. or 40s., and barley for 30s. or 60s. In the simpler states of society commodities are exchanged directly for one another; all

traffic is carried on by barter. As civilisation advances, as wants are multiplied, as division of labour increases, the necessity for some more convenient mode of exchange becomes apparent. It is found inconvenient for the man who produces nothing but food to ascertain how much of it he must give for clothes, to the man who produces nothing but clothing; and since even tailors sometimes take it into their heads to ride, it is equally troublesome for the tailor to calculate how many coats, waistcoats, and trowsers he must give in exchange for a horse. Nor are these the only inconveniences of a barter trade. If the tailor was starving for want of food, he could obtain none till he had found a man wanting to exchange it for clothes; he would then be obliged in all probability to take more food than he could consume while it remained good, and must look out for a third party who would be willing to take the surplus off his hands in exchange for some article which the tailor requires. The invention of money obviates these inconveniences. One commodity is exchanged for money; which, again, is exchanged for something else. Pounds in England, dollars in America, and francs in France, furnish in each country respectively a measure of the value of different commodities with respect to one another—a language in which that value may be expressed. The value thus expressed is its price. Gold and silver, from their rarity, and consequent costliness—from their durability, portability, and divisibility, and from the demand which exists for them, even in a rude state of society, for purposes of ornament—are, of all things, the best adapted for a medium of exchange. They have therefore, by the tacit consent of all nations, from the most remote antiquity, been preferred as money. One very important quality, which renders them specially suited to this purpose, consists in their being less likely than other commodities to be affected by fluctuations in value arising from a sudden increase or diminution of their quality. The only great and permanent change of this kind which they have undergone since the commencement of history is that which followed the discovery of America. After that event the precious metals became so much more abundant, that their value was lowered with respect to other commodities; and it became necessary to give more of them in exchange for a given quantity of any article of necessity or luxury. In other words, prices rose. Though prices rose, however, the value of commodities with respect to one another remained, with some exceptions, unaltered. The same quantity of one continued to exchange for the usual equivalent quantity of another. The only difference was, that a larger quantity of gold and silver must be given in exchange for both. The exceptional commodities were those of which the value in exchange for others was lowered either by their being produced in greater abundance than heretofore, or by improved processes which diminished the cost of production. Other commodities, again, such as corn and wool, fluctuated in value from fluctuations in seasons.

In the simplest form of commercial transactions, after the invention of money, and before the introduction of credit—which performs so important a part in modern commercial transactions, more particularly in England—prices depend not on the absolute abundance of the precious metals, or of that portion of them which is used as coin, but on their relative abundance to other commodities. If the production of these increases at the same rate as the production of the precious metals, prices will remain stationary. If the precious metals are produced in greater abundance than other commodities, prices will rise. If commodities in general increase more rapidly than the stock of gold and silver increases, prices will fall; and the rise or fall will be, in either case, in proportion to the increase or diminution of the material and metallic wealth with respect to one another. The quantity of corn, of iron, or of linen remaining the same, and the quantity of gold and silver being doubled or tripled, prices will be doubled or tripled. An increase in the quantity of gold and silver, however, only affects prices when converted into coin. The precious metals, in the form of bracelets and earrings, watches and teapots, exert no influence on prices. Neither does coin not in circulation affect prices. The hoards of the miser are as powerless for this purpose as the plate and trinkets of the luxurious. Both constitute a reserve whence the circulating medium may, in case of need, be replenished; but until put into circulation they might as well have no existence, as far as prices are concerned.

There are good reasons for supposing that the stock of gold and silver existing in the Roman Empire, at the commencement of the Christian era, was about three hundred and sixty millions, in the form of coin, exclusive of that employed for purposes of ornament. During the three following centuries the production of the precious metals diminished. By the fifth it had ceased altogether. Some of the mines were exhausted, the working of others was stopped by the irruption of the barbarians. Mining operations were not resumed in Europe till the eighth century. From that time till the discovery of America the produce was no more than sufficient to replace the annual loss by abrasion of the coin. It has been estimated, that by means of this, and other losses, such as shipwrecks, hoards concealed in troublesome times and never recovered, the stock of gold and silver had been reduced by the fifteenth century to about thirty-five millions sterling. To this cause may be attributed the low prices which prevailed during the middle ages, and the still lower prices of which we read before the reopening of the mines of the Old World in the eighth century. And to the low state to which the existing stock was reduced may be attributed the great rise in prices produced during the sixteenth century, by the addition of a new supply, which was small, compared with those which in subsequent times produced comparatively little effect.

In 1492 Columbus sailed on that adventurous voyage which resulted in the discovery of America. By 1599 the great revolution in prices which flowed from that expedition was complete. There is considerable difficulty in ascertaining, with any approach to accuracy, the extent of the change; so loose is our knowledge of the general prices of commodities in those times, so great the confusion respecting the value of weights and measures to which those prices refer, and so great the variations in the quantities of gold and silver contained in coins of the same denominations during different portions of the period. After striking off, however, that portion of the enhanced price which was not real but nominal, there appears little doubt, that in England, by the end of the 16th century, thrice the quantity of silver was requisite to purchase the same amount of necessaries and luxuries, as before the discovery of America, or rather before the opening of the silver mines of Potosi. In France and Spain the advance of prices appears to have been even greater. In Spain it is calculated as five-fold; and in France four-fold. This difference in different countries is no more than might have been expected. The commerce which has made England the richest country in the world had then no existence. There were not the same facilities as now for the transfer of the precious metals from country to country. In Spain, from its connexion with the sources of supply, they would accumulate the most: and between France and Spain there was more intercourse than between Spain and England.

The absolute amount of the precious metals by which this revolution in prices was effected is an interesting subject of inquiry, in which, however, we must be content with much that is conjectural, for accurate statistics there are none. Humboldt estimated that the total quantity of gold and silver derived from America, to the end of the year 1599, amounted to £138,000,000, after allowing for loss by the wear of coin. The greater portion of this sum was obtained after 1546, when the silver mines of Potosi were discovered. Between the discovery of America and the opening of these mines, the total amount of gold and silver brought to Europe is estimated by the same authority at not more than £17,000,000. During the century ending 1699, the mines of Europe and America are supposed to have yielded £337,000,000 of gold and silver, chiefly the latter. If we trace the effects of this influx on the precious metals on the prices, we find that the advance in the price of wheat, during this century, appears, by the Oxford tables, to have been from 27s., the average of twenty years at its commencement, to 36s., the average of twenty years at its close. As far as this can be relied on, as a criterion of prices, it would appear that this large increase in the production of gold and silver only raised them about 33 per cent. During the 18th century the average yield of the precious metals may be considered to have been doubled. At the commencement of the present century it had reached its highest point in 1810, after which it fell off in consequence of the anarchy which prevailed in the Spanish colonies on their separation from the mother country; and the suspension of mining operations which it produced. In 1806 Humboldt estimated the total annual yield of gold and silver from Europe, America, and the Russian dominions in Asia, at £10,755,000. For the century ending 1799 it might be estimated at £800,000,000, or eight millions annually on an average. In tracing the effect of this increase on the prices of commodities, those years must be excluded which succeeded the suspension of cash payments by the Bank of England, and the issue of inconvertible paper. Deducing the average price of wheat from the mean of the Oxford and Eton tables, and comparing the average of thirty years ending 1695, with the average of thirty years ending 1795, we have an advance from £1 18s. 5d. the quarter to £2 10s. 3d. The increase is rather less than 31 per cent. The accounts of Greenwich Hospital show an advance of about 20 per cent. on bread, meat, and butter, between 1730 and 1791.

A review of the produce of the precious metals during the 16th, 17th, and 18th centuries, and its influence on prices, would give then, from these data, results which may be thus expressed in a tabular form:—

Centuries.	Produce of Gold and Silver.	Increase of prices.
16th	138,000,000	300 per cent.
17th	337,000,000	33 ,,
18th	800,000,000	20 to 30 ,,

Why this difference? Why should the smaller sum raised during the 16th century produce so much greater effect than the larger sums of the 17th and 18th centuries? There were several causes in operation. In the first place, the smaller produce of the 16th century bore a larger proportion to the then existing stock of the precious metals, reduced, as before stated, to about 35 millions, than the larger produce of subsequent centuries bore to the stock in existence during those centuries.

In the next place, there had been a great and progressive increase in the productions of those commodities which are exchanged for one another through the medium of the precious metals; this increase requiring a corresponding increase in the quantity of the medium of exchange.

Lastly, there had been an increase equally great in the consumption of the precious metals for the manufacture of articles of ornament and luxury. With respect to the increase of material wealth, we know that the rise of prices consequent on the discovery of America gave a great stimulus to production, though we have no means of forming an accurate estimate of the rate of increase, or of the increase of population during the 16th and 17th centuries. Both, however, must have been considerable, and must have had a great influence in counteracting the advance of

prices which would have taken place had the medium of exchange increased, and the amount of commodities to be exchanged remained unaltered. The great and rapid development of commerce, manufactures, and agriculture, and the increase of population during the 18th century, and particularly soon after the accession of George the Third, is matter of such general notoriety that it is needless to attempt to prove them by reference to the more full and accurate statistical details which exist for that century.

With regard, again, to increased consumption of gold and silver in the arts, it is wholly of modern growth. It dates from the reign of Anne. The greater portion of the old plate in the possession of the nobility and public bodies belongs to that period. The introduction of tea, which then took place, and its continually increasing consumption, originated a great demand for silver spoons, which were scarcely known in the preceding reign. This demand received a fresh impetus at the commencement of George the Third's reign. Silver spoons were then made heavier than before, the use of silver forks was introduced; silver was employed in the manufacture of tea urns, tea pots, coffee pots, and salvers; and the use of such costly luxuries extended to lower grades of society. The use of watches became much more general, and the manufacture of copper plated with silver formed a new and extensive branch of industry in London, Sheffield, and Birmingham. The consumption of gold in gilding increased with equal rapidity. The number of goldbeaters was tripled in twenty years. At this time also commenced the practice of gilding silver articles, and of applying gilding to the decoration of the interior of public and private edifices. The manufacture of porcelain also began to consume large quantities of gold, which becomes totally lost by the fracture of the articles in the gilding of which it is used. From the combination of all these causes, the increase of population, and material wealth, and the increased consumption of gold and silver in the arts, we have a satisfactory explanation of the fact that prices only advanced from twenty to thirty per cent, while the metallic wealth of the world increased more than cent per cent. T.

ON THE ERADICATION OF WEEDS.

How shall we keep down the weeds in our cultivated crops? This is an interesting question, and one which all farmers will do well to study and experiment upon. We almost invariably find bad cultivation and light cultivated crops attended by a very abundant growth of weeds; just as we observe high farming and luxuriant crops pretty free from them. The one is both a cause and effect of the other. Something *will* always grow. If the soil is not pre-occupied, spontaneous vegetation will spring up; and finding space and air, and root room, all contributing to rapid development, the *weed* will ripen sooner than the corn, and we shall have the foundation laid for a succession of choking, smothering crops of weeds.

Then, again, climate has a great deal to do with the growth and development of weeds. The north and north-western portions of the island are, from the falls of rain and the prevalence of a cold moist atmosphere, far more stimulative of weeds than other parts of the country.

Now the most simple and obvious modes of eradicating weeds are hoeing and hand-weeding. But with some these processes are completely useless. If we take a class of small weeds, such as the spurry, the wild-mustard, and several others, the hoe would not be able to sever them from the tangled corn, and there they would grow and thicken, and sadly injure the crop; for no hoeing between the drills would reach them. You might hoe out all the weeds there, and it would only be giving fresh space for the side shoots of those weeds which grow amongst the corn.

But there are clearly such plants as the dock, the thistle, the redshanks, and other similar large-rooted and isolated plants, which clearly require to be pulled out by hand one by one. To those we shall more particularly subsequently allude, but at present we will just refer to a class of plants which are to be affected by general cultivation—the quitch or couch (*Triticum repens*), the spurry (*Spergula arvensis*), the charlock (*Raphanum raphanistrum*)—a class of plants always abundant in bad cultivated land, and which is a sad pest in some classes of land when well cultivated.

We will take the couch grass—the most formidable of all weeds, the pest of light turnip land, and the bane of the four-course system of husbandry. In the loamy descriptions of land, the better class of turnip soils, and in the chalk, it is a source of very little trouble; the one is of too consolidated a character to encourage its rapid spread by the roots or its early maturity in the seeds, and the other is far too dry to admit of its making much headway.

But the blowing sands—especially the black peaty, or grey sands—are those where it is almost impossible to carry on a continuous four-course rotation and not have its network of couch. You may clean your turnip fallow till not a fibre can be seen; you may hand-pick the land before it is sown with barley; you may eat on the seeds and

pick the land again before the wheat is sown, and not one particle of couch can be seen; the wheat may be horse-hoed and hand-hoed, but at harvest time there will be abundance of couch: it will be a net-work, as we say, of roots in the soil, and a mass of seed in the sheaves. The abundant supply of oxygen to the roots, the great capillary attraction of the soil in collecting moisture, and the natural tendency to early mature the couch in such soils, give them in the wheat crop a double advantage. The soil is open, and the mass of it undisturbed during winter, so that there is abundant space and time for the roots to spread; though we believe the period from June to November is that wherein the roots attain by far the greatest growth. Now, how can a farmer prevent this growth of couch on such lands?

Claying will effect it. This is a process as necessary to attain good crops of turnips, wheat, and barley, as it is of keeping down the enemies of cultivation named above. The consolidation of the soil prevents the access of oxygen too great for the wheat, and it is thus rendered too little for the couch; so that ordinary attention to cleaning, with a dose of 180 to 200 loads (cubic yards) of clay, of almost any kind, will soon so change the character of the soil as to render the couch a very feeble enemy.

Change of rotation will attain it. This is not always convenient, and often sadly deranges the proceedings of a farm. But if the seed pastures are allowed to run a second year, and are broken up say in the first week in July the second year, and a small allowance of manure given to the corn crop when sown, the wheat stubble will be found comparatively free from this sad enemy of the farmer.

Cultivation may partly remedy it — we mean the saddening of the soil, and the production of seedling crops. Thus a very heavy turnip crop covers with its leaves the soil, and thus prevents the progress of the seeds or the small particles of roots. Cake with the turnips and the seeds, by increasing the quantity of sheep kept on the land, consolidates the soil, and renders it less liable to run wild; while vigorous-growing crops, by overtopping the couch, renders it less liable to spread both upwards and downwards.

Green cropping extensively in proportion to the corn will prevent it. And this for two reasons. The green crops not being matured, are generally on the ground for a shorter period; there is far more upturning of the soil, more working among it, and, consequently, more disturbance of the roots and feebler powers exerted to master the soil, while the seeds—an unthought of, but fertile source of couch in light sands—are never matured.

To talk of "land natural to quitch," of "rye, grass, &c., turning" to them, betrays an ignorance approaching to barbarism; it is only a refuge for those who are too indolent to apply their energies to an eradication of the real enemies of the crop; for a field full of couch never produces a yielding crop of corn.—Gardeners' and Farmers' Journal.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

FRANCE.—No. XXV.

THE VALLEY OF THE RHONE — THE DEPARTMENT OF LA DROME.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

That part of France from the capital of which I write, is in several respects, a peculiarly interesting one. It may be taken as forming the district of separation between the Central and the Southern provinces. The olive tree advances only a short way beyond its southerly frontier, while, towards its northernmost bounds, vegetation begins to resume that green luxuriance which the burning sun and the rocky soil of the country lying along the Mediterranean generally deny. To the east, again, the department stretches to the roots of the French Alps—the mountain lichen and the pine appearing amid its far upland heaths; while, towards its opposite extremity, it borders on the rich plain of Languedoc and the northerly ranges of the Cevennes, separated from the neighbouring department of l'Ardeche by the rapid flood of the Rhone. So situated, the department of the Drome is a sort of miniature representation of the united features of divers of the principal districts of France —the Alps of the east blending with the scorched plains of the south—the primitive pastoral inhabitants of the hills fading into the busy, corn-rearing, vine-growing, oil-making, silk-worm rearing, and silk-spinning populations of Provence and Languedoc.

The soil of such a district must needs be very various. One portion of it produces some of the finest wines of France—to wit, those of L'Hermitage; other spots are dreary plateaus of barren sand, hardly growing a bush or a weed; and between the extremes of fertility and sterility there exist every intermediate degree of soil, devoted to every species of culture known to the south, the east, and the central provinces of France. Thanks to the neighbouring Alps, the department is well watered; for no less than twenty-two considerable rivers flow through it to the Rhone—each in the

centre of a more or less alluvial basin, sprinkled with villages and dotted with corn-fields, vineyards, and almost everywhere legions of mulberry trees. Towards the Alps, the country, of course, takes its most barren and desolate aspect, meadow and orchard giving place to healthy pasture land, generally belonging to the several communes, and frequently the site of ancient forests, which have been burned down to allow the sweet mountain grass to spring; seamed, however, every where by wide gravel scaurs, dry and burnt up in summer, but down which turbid mountain floods come roaring and rushing in the winter, frequently inundating the low country by bursting away the rude dykes opposed to them. Upon the Alpine slopes bordering the Drome vast flocks of sheep find summer quarters. Some of the flocks from the Craue penetrate thither. In general the cattle of several proprietors, with their keepers, unite to make the pilgrimage, leaving the low grounds in the month of May. Two or more superintendents, called *bailes*, always confidential servants, have the charge of the whole caravan, and the command of the shepherds. Each party purchases, at so much per head, pasture grounds for the summer, the communes, towards the close of the season, sending a species of jury over the hills to examine the state of the sheep-walks, and to see that no wanton damage has been committed by fire or otherwise. The price paid per sheep is generally under a franc, ranging from 50c. to 75c. for the summer. In general characteristics and modes of life, these shepherds resemble those whose appearance with their flocks I have sketched upon the Craue.

A few, but only a few, of the tributaries of the Rhone running through the department are navigable, and these are generally so rapid and rocky that goods are drawn up them at very great expense of time and labour, and often with much danger. As for the Rhone itself, it is all but unfitted for anything like heavy traffic. Fogs, which, in hopeless impenatrability and tedious duration, fling those of our much maligned Thames into the shade, brood almost continually upon the water during the coldest half of the year. Sometimes the vapour confines itself to the surface of the river, anon it rises and spreads through all the valley. I am writing on the third day of a fog which has stopped all navigation on the Rhone, from Lyons nearly to Avignon. But the nature of the stream is in itself all but sufficient to forbid active and profitable traffic. The swiftness of the downward current may be inferred from the fact that the difference of level between Lyons and Arles, to which the steamers descend in a day, is upwards of 600 feet. Besides this constant obstacle, the stream is provokingly irregular. It rises and falls with the sudden fits and starts of a wild Highland burn, having almost always either too much or too little water in its bed, while the floods are continually altering the depth of the channel, flinging up constantly varying banks of sand and shingle, and puzzling the most experienced river pilots. Thus a great proportion of the carrying trade between the centre and the north is performed by waggons—whole caravans of which are crawling night and day along the enormously cut-up road from Marseilles to Lyons. Taking Valence as a medium point, I have ascertained that the carriers in question perform the journey to the following places in the following times.—To Paris, 8 days; to Calais, 13 days; Marseilles, 4 days; Bordeaux,12 days; Clermont, 10 days; and Montpellier, 3 days. Barges on the river are still, however, employed. In some cases they are only constructed for the downward journey, and then broken up for firewood. Their seaward cargoes are very often coals from St. Etienne, and bottles for the Rhone vineyards from Givors. In mounting the stream the barges proceed by squadrons, called *equipages*, each one having its complement of labourers and fresh-water sailors. Before the introduction of steam, there were about 50 equipages navigating the Rhone. They floated down from Lyons to Beaucaire in two days. To return their weary way took generally from 28 to 30 days in the summer time, and from 35 to 40 days in winter—a dreary pilgrimage. During the prevalence of the mistral, they never attempted to make an inch of progress, but sought the most sheltered spot they could find, and lay to till the wind fell. Each equipage was dragged by thirty horses, and the danger and severity of the toil may be guessed from the fact that one-fourth of the whole number of horses were drowned every year—dragged from their footing by the sweeps of the heavy barges, tossed by stream and eddy, or plunging while wading along shingle banks, into deep hollows, dug by the last previous flood. These horses were fine, strong, docile creatures, costing from 1,000 to 1,200 francs. Each towing rank was led by a very tall horse, called *Le Pataillard*, and generally valued at about 1,500 francs. This leader sounded the passages for the rest, and was conducted by an experienced driver, who frequently stood upon the animal's back as he threaded the way for the team amid the streams and shallows. The men attached to each equipage were either ten or twelve, the greater part being drivers, and only three or four bargemen. The expense of working these floating caravans was estimated at about 3,000,000 of francs yearly. They conveyed, from Beaucaire the barge port of the south, to Lyons, about 810,000 quintaux or cwts. of goods, at charges varying from 5 to 10 francs per quintal, but averaging 6 francs, the total receipts being generally about 4,860,000 francs. Various proposals for a lateral canal, by which the voyage could be made in six or seven days, were from time to time broached, but came to nothing. One of the engineers employed to investigate this subject proved, during the infancy of steam navigation, how utterly impossible it was that steamers could ever run upon the Rhone, making out his point as irrefragably as Dr. Lardner did his, touching transatlantic steam navigation. Nevertheless steamers are now running upon the Rhone; but, odd as it may appear, they have not yet quite superseded the old towing teams. About a dozen of equipages are still, I am given to understand, kept upon their ancient footing. There are two classes of steamers, those which mount the stream merely as towing vessels, and those which take goods and passengers aboard. The former make the upward voyage dragging about as many barges

as the horses of yore, and accomplishing passages of from seven to ten days. The latter—enormously long boats, some of them not much less than 400 feet from stem to stern—ascend in two long summer days, or three short winter ones. Fogs are their great hindrances, next to the opposing blasts of the mistral, and the constantly alternating floods and droughts of the river. The Isere, one of the largest tributaries of the Rhone, which it joins near Tain, is ascended by barges drawn by oxen, each equipage consisting of three boats, carrying in all 800 cwts., and towed by 18 or 20 cattle. For the voyage between the point of junction of the rivers and Grenoble—a distance of about 62 miles—not less than from 15 to 18 days are necessary.

Down many of the smaller rivers wood is floated from the lower slopes of the Alps. Others serve to feed, not navigable, but irrigating canals—that great feature upon which so much of the cultivation of the south depends. Dykes and mounds to keep these ungovernable torrents in their proper places are only partially and inefficiently executed, and the consequence is that one portion of the country is imperfectly preserved from inundation at the expense of the certain ravaging of another. Here and there, however, these water fortifications have been the means of reclaiming considerable tracts of land which were previously either fœted swamps or barren banks of shingle. I have before me the particulars of many enterprises of this nature which have turned out highly profitable; but much still remains to be planned and executed, more, indeed, than there seems capital or industrial spirit in the country to grapple with. The irregating canals are sometimes fed from the rivers, sometimes from the overflow of the thousands of springs which gush up where the ground slopes to the barrier of the Alps. I have already sufficiently described the general way in which the fertilizing waters are managed and employed. The digging of the ditches in which they are conveyed costs from 1f. 50c. to 1f. 75c. per yard. One previously barren plain in the department was brought into abounding fertility—meadows of the richest and ripest grass springing up where previously dust and powdered rock had reigned supreme—by a canal about 9,000 yards long, costing altogether 60,000 francs. The value of the increase of production, in the first season, more than equalled the cost of the work. The influence of this excellent canal is prevented from being extended to another barren plateau by the obstinacy of two individuals, who refuse to allow the works to be carried across their lands, although they have been offered more than double the estimated worth of their entire estates.

The department of the Drome is celebrated for the number of regiments famed in the annals of the Republic and the Empire of which it furnished forth the living material. During Bonaparte's wars the conscription carried off yearly no less than 2,600 young men—the flower of the district—out of a population considerably under 300,000. Of the 2,600 recruits—I am now quoting from a curious local volume, containing a great deal of interesting and out-of-the-way information upon the district—the average number belonging to different trades and occupations was nearly as follows:—

Farm labourers	2,095
Workers in iron	40
Workers in wood	55
Bakers	15
Masons	30
Shoemakers	47
Tailors	23
Miscellaneous	295

Out of the 2,600, about 460 were annually rejected from physical causes. The table is not without its bearing upon the physical development and sanitary state of the south-east of France.

Under height (4 feet 9 inches French measure, about 5 English feet)	145
Deformed	18
Ringworm and disease of the skin of the head	18
Broken bones	102
Scrofula	25
Defects in sight	30
Hernia	35
Defects in organs of speech or hearing	26
Sores and ulcers	38
Consumptive tendency	23
Total	460

The sanitary condition of the district is not high. In many localities the food consumed is scanty and of poor quality. The peasantry frequently attempt to make up for the deficiency of nutriment in their food by swallowing quantities of oil, and the effect is an extreme tendency to hernia. Ill-ventilated and dirty cottages also produce their usual concomitant of fever, which is often extensively fatal in the little bourgs scattered among the valleys. The country cottages in the vicinity of Valence are certainly below the average of French peasant dwellings. They are composed, in general, of a single earthen-floored room, with a small garret above. The windows are unusually small, and the broken glass is frequently stuffed with fusty rags, converting the interior into a damp, dark, and unwholesome hovel. All round the place is generally heaped a circumvallation of dung; the most "sappy bits of the middenstead" being very often close to the doors and windows. In some of the more remote districts, I am told that the people actually have dunghills within doors, in the corners of their single living, cooking, eating, and sleeping room. The box-tree flourishes hereabouts on the hills, and its leaf is esteemed to make a very stimulating manure. The plant is, therefore, cut down in great quantities for this purpose, and left to rot about the cottages, the process producing a peculiarly fœted and pungent smell, which is said to be frequently the cause of fever. In the small bourgs, during the autumn and winter time, the houses rise from a sea of incipient manure; and in the villages, both in this and the neighbouring department of Ardeche—parts of St. Peray form a good example—the filthiest blind alleys and dens of living places, above stables and piggeries abound. Another anti-sanitary circumstance is the existence of a prejudice against burying, or in any way dispos-

ing harmlessly of animals which have died from accident or disease. Their carcases are left to rot in the open air. In the upper portions of the department, *goitre*—with, to some small degree, its wretched accompaniment, cretinism—prevails. So much for the appearance of the small bourgs and villages. The larger class of farm-houses differ only from these in being, perhaps, somewhat ruder and rougher than those which I have sketched as generally existing in Lower Provence.

The aspect of the richer and better cultivated part of the country is very smiling. The land is commonly divided into small fields by single rows of vines, trained upon *echelas*, and sometimes shooting up higher than a man. Sometimes a row, single or double, of well-pruned young mulberries runs from end to end of the field—sometimes joint ranges of vines and mulberries, cut into long stripes, with the corn land between. The banks rising up from the Rhone are generally very stony, and are terraced for the vines; the culture being generally carried on by hand, and by means of heavy double-pointed pickaxes. Boxwood leaves are the common manure applied to young vines.

As usual, the country, in the most populous parts, is split up into hundreds of wretched little estates, mingling here and there with larger *exploitations*. Very few extensive proprietors cultivate their land, and the farming is either managed by persons paying a fixed rent, or by metayers. The latter arrangement is by far the most common. The farmers at a fixed rent often pay not in money, but in kind; but the metairie method may be said to be the custom of the country. The cultivators in question are here called *grangers*. The following are the ordinary terms of the contract:—The proprietor finds the house of the metayer, pays all public and local burdens, except the local road services, keeps all fences and farm-buildings in repair, furnishes one half of the cattle, whether for draught or other purposes, and one half of the carts and waggon. The metayer finds the other moiety, and binds himself to keep in repair at his own cost the ploughs and harness, and generally to be at the expense of all the iron-work requisite in keeping in good condition the large farm implements. The leases ordinarily given whether for metayage or at fixed rents, are for periods of six years, with power upon either side to terminate the engagement at the close of the third year, upon giving six months' notice. A few nine-years' leases are granted. The conditions generally stipulated in these documents bind the farmer to the ordinary routine of the district. He is always bound to leave the same quantity of grass-land upon the farm which he found on entering. Up to within a recent period the primitive agricultural fashion of alternate grain crops and fallow was the only method of rotation known. The general routine was for the farmer to sow one half of his domain every year, leaving the other inactive and unproductive, except a small patch devoted to vegetables for the consumption of the family, or, perhaps, when manure was abundant, to the production of a small crop of hemp. The introduction of artificial meadows and of green crops has to some extent broken up the ancient practice, but I am informed that many leases still exist, binding the farmer never to take two successive crops of any kind whatever out of the same soil, without copious and expensive manuring. The artificial meadow system is yet, I believe, confined in a great measure to the few proprietors cultivating their own land, or to the equally small number of farmers possessed of some little capital, and holding under long leases. A singular feature in the agriculture of the district is that the harvest is always reaped, not by the farmer himself, or his people, but by a band of labourers called *dimiers*, of whom the regular labourers of the property may or may not make part, and who are paid by receiving a fixed proportion, generally 1-7th or 1-8th, of the whole harvest. This per centage is paid in equal parts by the farmer and the proprietor, and after it is subtracted, the division of the remainder takes place. The dimiers not only cut the corn, but form it into stacks, and thrash and winnow it. They are frequently mountaineers, who descend periodically to the low country to perform the duty.

The earth is hereabouts ploughed, or scratched, three times per annum; first in spring, then in summer, and again towards the close of autumn, at sowing time. The operation is generally performed with oxen—two or four to a plough, according to the nature of the land. The small proprietors employ mules, one of which is kept by each, and formed into a team, of which each contributor has his turn of service. Cows are also sometimes yoked to the plough. I saw one patch of land with its corresponding hovel, which boasted a lean unhappy looking cow of all-work. This useful animal dragged the plough, the harrow, and the cart, and half supported the entire family on her milk. The ploughing oxen are left to graze under the charge of a neatherd, until they are required for work. Many of the small proprietors drive a traffic in rearing mules, excellent specimens of which are produced in this district. The average size of farms not cultivated by their proprietors is from 40 to 50 hectares in the lower districts—from 20 to 30 in the more alpine regions of the department. In the former case, each farm is commonly provided with six labouring oxen, from 50 to 60 sheep, and from 10 to 15 pigs. The lattter animals are commonly sold at the age of seven or eight months. On the mountain farms you commonly find one pair of oxen, one or two mules, and from 80 to 100 sheep.

Plaster has lately been introduced with success as a manure. The mixture of earths is also frequently resorted to as a fertilizing process. You often see a grass field being covered with a thin layer of earth derived from a distant part of the farm. The rotten leaves of trees furnish also no inconsiderable portion of the whole quantity of manure used. Marl is employed in a few localities, but stable litter is the basis of the manuring system. I often see, in this as well as in other districts of France, concentrated chemical manures recommended, in flaming placards, to the attention of "*Messieurs les Cultivateurs*;" but I believe that the latter seldom place much confidence in the real or alleged virtues of the composts in question. Except in one or two of the districts near the capi-

tal, the farmers have never heard of such a material as guano.

Thrashing is either performed in winter, in the barns, or in summer immediately after the grain has been cut down, and while it still lies in sheaves in the field. In some cantons the flail is used. In others a sort of switch or rod is employed, and the women and children, as well as the men, are set to wield it. This rude manner of disengaging the grain I have seen practised in the Pyrenean valleys, the operators being often mere children, and the grain being generally buckwheat. In the mountain cantons the corn is thrashed by driving horses or mules over it, just as I have described in the cases of the Crau and the Camargue. The merits of this antique agricultural practice are stoutly disputed in the district. The upholders of the "circus" fashion calculate that 6 mules in 6 days can thrash out as much wheat as 8 men in 20 days. Their opponents maintain that a great proportion of the grain is crushed by the animals' feet, and that so imperfectly is the operation performed that, in a handful of ears trodden out, there remain on the average from 15 to 25 grains. The straw of horse-thrashed grain is, as may be conceived, inferior for all farm purposes other than making manure.

Not quite one-half of the natural grass land in the department is submitted to artificial drainage. The greater part, therefore, of the meadows, produce only one harvest of bad hay, for the raising of which, regular annual manuring is requisite. The water meadows give two and sometimes three crops. For irregating purposes, the streams from fountains are esteemed the best. The water of some of the smaller rivers has a rich fertilising effect upon the land. Lucern is the main green crop in cultivation. It is sown in spring, after wheat crops—the stiffer the soil the better. After the second year the herb springs abundantly, yielding three annual harvests to the sythe. Lucerne is often cultivated for periods running from four to ten successive years. Lime is the manure commonly used in its production, as well as in that of all green crops. It is laid on in quantities varying from four to five cwt. a hectare.

The live stock are fed in winter, in great part upon straw. The pigs are also made to eat it, although the regimen is little to their liking. The leaves of several of the most common trees, particularly those of the poplar and the willow, are also used for the winter food of sheep. The second crop generally furnished by the mulberry tree makes excellent fodder, which all species of farmyard cattle eat greedily.

A little madder is cultivated, principally by hand labour, in the south of the department, but the best land is generally devoted to lucerne. Among the gorges of the mountains, extensive nut woods grow, producing, on the average, fruit from which is expressed not less than from 15,000 to 20,000 hectares of oil.

The almond tree has been reared to some extent, but recent frosts have kept down the value of the produce, and checked the cultivation. There are two different species of chestnut trees common in the district. The superior class produces fruit extensively used by the peasantry as food. Immense barge loads of the nut are floated down the Rhone and sold along its banks. The wild chestnuts are given to the cattle and pigs. On the southern border of the department, the olive flourishes on favourably exposed slopes, and a quantity of good oil is made. The tree, however, has deteriorated, in common with its kindred still further to the south. The principal and most important species of wood which abounds in the district is, however, undoubtedly the mulberry. Hereabouts were planted the first trees of the kind introduced into France, and now the whole country is lined and dotted with mulberry trees, the tending and training of which forms an important item in rural industry, and to some account of which, and of the rearing of silkworms, my next letter will be devoted. The vines of the district, including as they do some of the very first growths (particularly of sparkling wines) in France, will also form the subject of a separate communication. I need only remark here *en passant* that about 24,000 hectares are planted with vines, producing about 400,000 hectolitres of superior and common wines. Vineyards are pretty generally cultivated by hired daily labour. They are divided, as those of Bordeaux, into *journaux*—each *journal* containing 500 vines, and yielding about 35 litres of wine.

As I have stated, mules and oxen perform the main part of the farm work of the district. There are employed in the department upwards of 15,000 of the former animals, the total amount of horses being little above half that number. A great proportion of the mules come from Auvergne. They are brought thence at two years of age, bred and broken to work in La Drome, and resold as soon as they have come into their full strength and vigour. Of the oxen, the last published tables state that the number used for work was 9,316; in fattening, only 722. Of cows used for work, 2,834; in fattening, 193. Attempts have been made, and with partial success, to cross the sheep of the district with Merinos. The government had at one time depôts of rams stationed for the purpose through the country, but these establishments are now broken up. The ordinary sheep of the country furnishes from 3lbs. to 4lbs. of common wool; but here and there are to be found animals of a better breed, said to be descended from a race produced as far back as the time of Colbert by crosses with the Merino. The number of sheep in the department is about 400,000.

So much, then, for the agriculture, strictly speaking, of the Department of the Drome. I proceed to give some account of the physical and moral condition of its rural population. The children of small proprietors and farmers are commonly set to work as early as six or seven years of age. Their initiation into rural employments is, as may be imagined, the herding of cattle. They are also entrusted with the care of flocks of turkeys, vast numbers of which are annually bred. A boy is often put between the plough stilts at the age of twelve; and girls not more than ten years of age may be frequently seen carrying heavy burdens, often of manure in the fields. The children of artisans almost invariably follow their father's em-

ployment, serving an apprenticeship of from two to three years, commencing generally at the age of fourteen. The food ordinarily consumed by the rural and labouring population may, I am told, be divided into three general classes—viz., that partaken of by the families who can habitually afford to eat white bread and cheese—by those who live for the most part on mixed grain and potatoes—and by those who eat oatmeal or buckwheat cakes mixed with a little barley. In the more remote and hilly districts the meal of chestnuts, and in some cases even of acorns, enters into the composition of the bread consumed. As a general rule, the peasantry live upon bread of various kinds, preparations of milk—ewe and goat principally—and the usual messes of soups and stewed vegetables, served (when the people can afford it) in perfect floods of oil. Cabbage and oil is also an especially favourite dish. Of the animal food used, salt pork forms the chief ingredient; but it is employed rather as a relish than a substantial article of fare. As in other parts of France, three meals are taken in winter, and four in summer. The first eaten at daybreak before proceeding to work, is oddly enough called "dinner." Its materials are usually soup and a morsel of pork, or at least lard. The second meal is eaten at noon, and called *Le goûter*—the appellation of the third repast in the central and northern provinces. It consists, for the most part, of cheese and dried fruit. The third goes by the name *Le petit goûter*, and is composed of no better materials than a morsel of dry bread. The fourth meal—the *souper*—is eaten after working hours, and is generally the most substantial of the whole, consisting of soup, stewed vegetables, and as much pork as the means of the family will afford. In winter the *petit goûter* is omitted. Wine in small quantities is commonly drunk during the week, and on Sundays the consumption in the cabarets is, I am assured, very considerable— an assertion, by the way, which I can well believe, without in the least degree impugning the sobriety of the population—the quality of cabaret liquor being of the thinnest and sourest. The cost of the food of each peasant in an average year is estimated, by competent authorities as ranging from 60 to 70 centimes—or from 6d. to 7d. sterling—per day. As a general rule, the people living within a certain circle in the vicinity of towns —the greater the town the wider the circle—fare better; wages are higher, butcher's meat more attainable, and the vegetable markets abundantly stocked. It has been calculated that, ordinarily speaking, the majority of the inhabitants of towns in this part of France live twice as well—spending twice as much in eating and drinking—as the majority of the inhabitants of the country.

In remote districts, the medical aid supplied to the people is scanty and inefficient. Sometimes, indeed, it is furnished not by regular practitioners, but by a set of rural quack herb-doctors, who tell fortunes and make up charms—vervain being, as of yore in England, one of the potent ingredients of these *quasi*-medical authorities. They are frequently old men and women, as grossly ignorant and superstitious as the dupes upon whom they practise. But the truth is that it is not easy, in certain districts in France, to persuade medical men—well educated and accomplished persons—to forswear all society, and settle down in a country where, for dozens of square miles, they can expect to find nothing but the same stagnant level of ignorant peasants—where there is not a resident gentleman, and hardly a resident proprietor—at least what an Englishman would consider a proprietor—and where the people are so uniformly poor that the realisation of anything like a decent livelihood is out of the question. A vaccinator is appointed by the government, however, to reside in each commune, a departmental budget of 3,200f. being allotted for their services. Besides this the local authorities support from 30 to 35 insane paupers at different establishments in Avignon and Lyons. The board exacted ranges from 300f. to 400f. per annum. It sometimes happens, however, that dangerous madmen have to be sent to the prisons to keep them out of harm's way—a most melancholy and barbarous resource.

As is the case generally in the south, *patois* is the habitual language, not only of the peasantry of La Drome, but in many instances of the better classes while in unrestrained family intercourse. In a communication written from Agen, on the Garonne, I described a visit paid to the principal poet of the *patois* of the south of France, and I transcribed his opinion as to the dialect in which he wrote. From various incidental notices in subsequent communications, the reader will have perceived that, all over the south, the peasant language differs not only in every province, but often in almost every parish, There are two leading dialects—that of Provence and that of Languedoc; the Provengal becoming more and more Italianised as you approach the Alps—the Languedocian becoming more and more like Spanish as you approach the Pyrenees. Let those who wish to obtain some idea of the geographical limits of the dialects in question refer to the map, and draw a line, in the first place, from the Mediterranean, about Grasse, passing by Digne, Sisteron and Serres, to the Rhone, about Montelimart. Within this triangular space, including Marseilles, Avignon, Arles, Aix, Draguignan, and Carpentras, the pure Provengal dialect is said to be spoken. Northward it undergoes such changes as to be no longer the same language. Take the map again, and describe another similar triangle from the Rhone, on the right bank to the sea, passing by Privas, and running south-westerly as far as Beziers, or between Beziers and Narbonne—and you have the district to the north of which the true Langue d'Oc is no longer spoken in its purity. In this way the little town of Montélimart is the point to which Languedocian on the one hand, and Provengal on the other, extend. Northward the varying shades of dialect change with every parish and every commune; so that the familiar language of a peasant inhabiting any given district would be with great difficulty, and only partially, comprehended by a peasant living ten miles to the north, south, east, or west. In my daily rambles in the fields, vineyards, and olive grounds of the south, I found very many instances of labourers no more able either to speak or comprehend French than they were to discourse in Greek. These were generally old men. Occasionally, however, and particularly in the Camargue, I found young men

and boys equally ignorant. The greater proportion of the peasants spoke French slowly and imperfectly, mingling it with the jargon of their mother tongue, and sometimes particularly in a lengthened sentence, fairly breaking down, and apologising with a good-humoured embarrassment for being obliged to have recourse to *patois*. As a general rule, however, they understood French, particularly if you were careful to use only the clearest and most practical thoughts, couched in plain and homely language. About Nismes *patois* is generally spoken, even among the well-to-do people in the town; and Nismes French is proverbially barbarous. As a general rule, the *patois* of the south is said to be excellent for the expression of common wants and common feelings, but it is powerless to clothe in words anything like an exalted sentiment or an abstract idea. In the schools hereabouts instruction in French is generally communicated through the medium of *patois*, and the clergy frequently use it from the pulpit. I have been told by persons well able to judge, that *patois* spoken by educated people—that is, the more refined and elegantly and smoothly pronounced versions of it—forms a very beautiful language—sprightly, pathetic, and well qualified to describe ordinary matters with a peculiar richness and picturesqueness of idiom unknown in pure French.

Soon after the beginning of the present century some progress was made by the French Government towards gathering materials for a philologic history of the dialects of the language. The parable of the Prodigal Son was selected, and directions were given for its translation by competent authorities into every dialect in France. I have before me the returns made from the department in which I write. They comprehend three distinct specimens of *patois*—those of Valence, Die, and Nyons. I copy the first two verses of each :—

PATOIS OF VALENCE.

Un homé avio dous garçons. Lons plus djeuné diguet à son peré—Peré, bela me la part dè bien que me rèven, et lou peré lioou diviset on bien.

PATOIS OF DIE.

Ero un homme qu'ovio doux éfons. Lons plus dzuené doou doux li dicet—Moun peré, beile me ce' qué pouo me reveni doou bien ; et sou peré lon fogae lou portadze.

PATOIS OF NYONS.

Un homé avi dous garçons. Dounté lon pu jiouiné digné a soun peré—Moun peré, douana mé lon bén que mé deou beni per ma part ; é lur fugué lon partagi dé soun ben.

There are evidently slight differences in the construction of the sentences in the translations, arising probably from the differing genius of the varying dialects. Pernicious and socially retarding, however, as the existence of *patois* is, matters seem to have been immensely changed for the better since the time of Louis Quatorze. A very curious letter is extant, written by Racine to La Fontaine, giving an account of a journey made by the former into the south of France, and in which he states that after passing Lyons he found himself entering a region of unknown tongues. "I could neither," writes the tragic poet, "understand, nor mak myself understood ;" and he proceeds to give an instance in which there is more humour than delicacy. This is stated to have happened at Valence. At present there seems no immediate chance of French supplanting the local dialects, but the rising generation are, as a general rule, learning both the one and the other.

The costume of the people, with the exception of that of the Dauphinese mountaineers, is in no way remarkable. These last wear a species of tight-fitting jacket or doublet, and breeches of coarse home-spun cloth, with mighty worsted stockings drawn up to the middle of the thigh. On their heads they carry broad-brimmed felt hats. This ancient fashion is, however, dying out, and with it the rough country manufacturers of coarse strong cloth. The female peasantry often wear quilted cloaks of strong calico. They look cold, but are really warm and comfortable. As usual, cafés and billiard-rooms abound in all the villages. I am told—and the truth of the observation is, I have no doubt, general—that they have been almost entirely introduced by the habits carried back to their birth-places by discharged soldiers, who cannot forego the amusements of garrison towns. Fêtes, called locally *vogues*, are common. In the country each commune has its festival anniversary. In the towns each guild or trade corporation celebrates its rejoicing day. When I was at Avignon the shoemakers celebrated their annual saturnalia. A discordant band—playing, by the way, the "Row Polka" as its principal *piece de résistance* (the fact is very unromantic, but perfectly true)—took its way along the streets on the eve of the festival, attended by crowds of boys with torches. Next day a company of neatly dressed young men and women, glittering with rosettes and bouquets, and accompanied by the primitive pipe and tabor, carried round baskets of *pain beni*, which they distributed at the better class of houses and shops, gaining a small gratuity at each, to be spent in a ball at night. Altogether the affair was modestly and pleasantly managed, without the tom-fooleries and grossness of almost the only remaining relic of such old usages in England—the sweeps' observance of May day. In the country, on the occasion of communal fêtes, there is a dinner, succeeded by games of skittles and bowls for the elder and married men, and dancing for the *jeunes gens*. I am concerned to be obliged to add that the *salle* of the correctional police frequently witnesses the unpleasant wind-up of the festivities. In some districts New Year's-day is observed as the "Fête of Labour." Before the Great Revolution this fête lasted three days. It is now reduced to one, and is generally conjoined with a ploughing match. At Montelimart this fête takes place upon May-day. The custom has partly a religious bearing—the labourers invoking the blessing of Heaven on the growing crop, and going to hear mass, decorated with all manner of bouquets and favours. The first Sunday of May is observed in many districts as a sort of fête of flowers. A King and Queen of the May are elected; and the rites observed much resemble our old English festivities round the maypole. Contributions are levied upon these occa-

sions, Eton Montem fashion, from all by-passers—the idea, according to a local legend, having been taken fron a particular year in which, *faute de mieux*, a very ugly girl was elected Queen of the May; and an ungallant passenger, so far from availing himself of the privilege of kissing the presiding goddess of the festivities, was rich enough and rude enough to offer a crown to be excused. The peasants caught at the notion, and afterwards elected such May Queens as were sure to bring in a handsome revenue. The custom of paying, as in many other places, continues long after the actual requirement has passed away.

The educational statistics of the district contain a curious feature or two. The number of children receiving primary instruction amounts to about 18 per cent. of the population. Of these, one-half go to school only in winter; and the number of boys is double that of girls. In the highland districts the nature of the country—so wild, roadless, bridgeless, and thinly inhabited—prevents the children of each commune from being gathered together under a common master. The inhabitants of small districts are, therefore, often obliged to raise a species of subscription to pay a schoolmaster, who arrives in the winter, and boards with each farmer alternately, dispensing his instructions in the neighbourhood in which he happens to be for the nonce located. As may be supposed, the knowledge imparted by these poor people is of the humblest kind, but it is better than none. At the autumnal fairs in the hills, I am told that they still parade the market-place, waiting to be hired for the winter, either by one or a united body of farmers, distinguishing themselves from the mob of farm servants by wearing a goose's quill stuck in the bands of their hats. The poor wretches, in fact, work like the *bouviers* and *valets de ferme*, and spend the long lone evenings in teaching their hosts to make pot-hooks and hangers.

A sentence more about the rustic festivals to which I have alluded. One unwilling hero frequently cuts a conspicuous figure in the rout. This is the man who during the by-past year has allowed his wife to beat him *publicly*. I hear of no penalty for those who are suspected of having undergone the chastisement in private. The unlucky wight in question is mounted upon an ass, with his face to the tail, the animal being led by two men, their necks encompassed by donkey's collars all jingling with *grelots*. In some more merciful cantons a curious vicarious penance is practised, the next-door neighbour of the petticoat-governed gentleman being the representative of his acquaintance.

ON THE TEETH OF HORSES AND CATTLE CONSIDERED ESPECIALLY AS INDICATIONS OF AGE.

In answer to a letter from a correspondent asking information concerning the means of judging of the ages of horses and cattle by their teeth, I have prepared the following paper, in the hope that it might supply the required information, and also prove of some interest to general readers.

The teeth are the hard, white, comparatively insensible, bony-like structures, situated in the alveolar processes of the maxillary or cheek bones. In most animals they consist of three different structures beautifully arranged to ensure the greatest possible amount of strength and permanence—the *bone, ivory*, or *dentine* constituting the great bulk of a tooth, consisting of minute tubes, lying close to, and interlacing each other, and immersed in granular matter; the *crusta petrosa* or *cementum*, the softest constituent of the tooth, the soonest worn away, and employed for binding together the more complex teeth, as the molars; and the *enamel*, very hard and crystalline in structure, scarcely organized, very indestructible, and applied over those parts most exposed to wear.

Teeth consist of several different parts, which it is important to distinguish. 1st. The crown or upper part, which in the horse has two cutting edges, and between them an irregular oval-shaped ring of enamel, enclosing the softer dentine, which is readily stained black by the food. This ring, with its blackened centre, constitutes the *date, infundibulum*, or *mark*. 2nd. The neck, enclosed by the gums, or fibrous material which fixes them to the bones beneath. 3rd. The root or fang, of a more or less triangular shape, fixed firmly into the hollows of the bones, and which, by the gradual wearing down of the crown or neck, comes nearer and nearer to the surface, and in old horses is often the only part of the tooth which is left.

There are found in the mouth of most of the domesticated animals three different kinds of teeth—*incisors* (or nippers), placed in the front part of the jaws, intended for the prehension of food, very simple in their structure, provided with a sharp cutting edge (in horses with two), and exemplified in the front teeth of men or dogs; *canine* (tushes), situated behind the incisors, curved, round, and pointed in shape, and especially developed in carnivorous animals, as the dog, but also found in man and the horse; *molars*, located in the back part of the jaws, consisting of several simple teeth cemented together, presenting broad and irregular surfaces, adapted for grinding or triturating the food, and seen in greatest perfection in graminivorous animals, in which from the nature of their food they are more especially required.

But leaving these anatomical and physiological details, with which I fear the agricultural reader is already heartily tired, I now pass on to the more practical parts of the subject.

The adult horse has forty teeth, namely 12 incisors, 6 above and 6 below; 4 canine, 1 on each side above and below; and 24 molars, 6 on each side above and below. The mare has the same number of incisors and molars as the horse, but has no canine teeth. Both are provided with a set of temporary, deciduous, or milk teeth, which make their appearance at birth or shortly after, and become gradually displaced as the animals approach maturity by teeth of the permanent set. The colt has 24 temporary teeth —12 incisors, 6 in each jaw above and below; and 12 molars, three on each side above and below.

It is often of much importance to ascertain the age of a colt before he has got any of his permanent teeth, and this may be done with tolerable accuracy by any one who knows the times at which the different incisors appear, and the changes they subsequently undergo. At birth the two central incisors in the lower jaw are usually cut; but if not, they appear in a very few days; the coresponding ones in the upper jaw are usually a little later. In a month or five weeks, the two next above and below come up, and before six months the two corner ones also. By the time the animal is a year old, all the temporary incisors are fully formed, and coming into wear. When a year and a-half old, the central teeth show marks of wear, become crooked, cornered, uneven, and narrow at the necks, and the gums grow up between them. When two years old, all the temporary incisors are much worn, have lost all remains of the date, and, owing to the great enlargement of the jaws, are irregular and widely separated by the gums. These temporary incisors are distnguished from the permanent ones by their small size, white colour, smooth, shining, rounded appearance, and narrow necks.

When the colt is two and a-half years old, the two central temporary incisors in the lower jaw are forced out by the irruption of the two first permanent incisors which come up in their places. They are succeeded in a few days or weeks by the corresponding couple in the upper jaw, in which the irruption of the teeth is generally a little later than below. These central incisors are somewhat oval shaped, are large and strong, and usually last longer than any of the others, though they are tne first to appear, and are much exposed to tear and wear. Within a year, the next temporary incisors on either side above and below are displaced by the growth of the corresponding permanent ones; and within another year (when the animal is about four and a-half years old) the temporary corner incisors are shed and their places occupied by horse teeth. The corner incisors are more triangular than the others, the date is smaller but deeper (especially in the upper teeth), and hence is longer in disappearing. When the animal is five years old, all the incisors should be fully grown, regular and even in appearance, and coming equally into wear. After this, the age, as judged of by the incisors, is known by the amount of wear, the presence or absence of the date, and the general shape and appearance. At six, the central incisors of the lower jaw have become considerably worn, and the black mark or date is either entirely gone, or very indistinct. Amongst the heavier breeds, and those chiefly kept on soft food, the ring of enamel, however, is still perfectly seen, and even the black marking within it may be so little erased, that the animal might sometimes pass for year younger that he really is. But his true age can scarcely be mistaken, if attention be paid to the wear of the corner incisors and the tushes. At seven, the mark is gone from the next pair of incisors, and at eight from the corner ones; and after this, the appearance of the upper teeth must be noted. About ten, the central incisors lose the date; at eleven the next pair; and at twelve the corner pair. After this, the age cannot be ascertained except with much practice and experience, and never with so much certainty as in younger animals. As age advances, the head and sometimes the neck of the tooth are worn away, and the root or fang is all that remains. The teeth are consequently much straighter, and more projecting, triangular in shape, broader from before backwards, than from side to side, dull and opaque, covered with tartar, and yellow or brown in colour, for the root is softer than the other parts of the tooth, and hence more apt to be stained. The gums and alveolar processes are shrunk, giving the teeth a bare and unsupported appearance. After twelve years, the extent of these changes is the chief means of ascertaining the horse's age.

The canine teeth or tushes, of which there are four in number, are the most crooked teeth in the horse's head, are rounded, especially on their outer surface, and turned inwards at the point. They are coated externally with enamel, which gives them a bright and polished appearance. In the horse, they do not serve any very obvious purpose, except to maintain the analogy between different classes of animals. There are no temporary canine teeth. The permanent ones appear between the fourth and fifth year, usually nearer to the latter. They can only be safely used as indications of age in connection with other appearances, for their wearing is very irregular, and much modified by the shape of the mouth. In aged animals they become quite round and blunt.

From the position of the molars, they are seldom examined as criteria of age, and do not therefore require such lengthened notice as the incisors. They consist of several simple teeth compacted together, those in the upper jaw being made up of five, and

those in the lower of four separate parts. They are nearly square, except the end ones of each row, which are triangular. They are roughened on their summits by ridges of enamel which run across the teeth, and fit into corresponding depressions on the opposing teeth, thus effectually perfecting the trituration of the food. In the upper jaw (which is larger and projects over the lower), the outer edge of the teeth in each row is deeper than the inner; and in the lower jaw the reverse obtains, namely, the inner edge is deeper or higher than the outer. By this simple arrangement, the food is easily and securely retained betwixt the teeth, and prevented from being thrown either into the mouth on the one side or the cheek on the other.

In the adult horse there are twenty-four molars, but there is also a deciduous crop of half that number. Two of these in each row above and below are usually cut at birth, and in four or five weeks, the third in each row is added. They are all small and soft, and when the animal becomes dependent upon its own resources for subsistence, it soon requires a more extensive and efficient grinding apparatus. Accordingly when the animal is a year old, it gets its first permanent molars, which are the fourth in each row above and below. At two years old, the fifth is also up. At three, the first temporary molar of each row is superseded by a permanent one; at four, the second in each row shares the same fate; and at five, the third in the row is also replaced by a permanent molar. About five years old, or a little before it, the sixth molar in each row also appears, and the animal having got its full complement of teeth has, in the language of the stable, a full mouth.

The abnormal appearances of the teeth of the horse are produced in many different ways, sometimes by natural, and sometimes by artificial causes, and occasionally by accident or disease. They differ, however, so much in their causes as well as in their nature, that it is impossible to arrange them methodically, and I shall not therefore attempt any special system of arrangement.

Horses have sometimes supernumerary teeth, which usually appear in the space between the molars and incisors, and are commonly called wolf's teeth. These are of two sorts—1st, temporary incisor teeth, which have remained after the irruption of the permanent ones, and are pushed by them either to one side or directly outwards; as they usually interfere with the biting of the horse, and are not firmly fixed into the jaw, they should be extracted. 2nd, teeth partaking of the appearance of molars, and situated midway between the incisors and molars; they are merely supernumeraries, but as they do no harm, and are firmly fixed into the jaws, they should not be meddled with. *Shell teeth* are incisors in which the posterior or inner edge is thin and easily worn away. In the early growth of such teeth, the cavity is unusually large, and the date imperfectly formed; but the latter now becomes entirely obliterated, and nothing remains but the outer shell of the tooth, which usually makes a deep mark or notch in the opposing tooth. The corner teeth, which are never so perfectly formed as the others, are most subject to this imperfection; which appears to depend upon some constitutional cause, and usually co-exists with extreme softness and brittleness of all the other teeth.

One of the most common of the various tricks employed to deceive the simple while judging of the age of the horses, is the forcible extraction of the temporary teeth, which causes the premature appearance of the permanent ones. The usual time for commencing the practice of this trick is when the colt is eighteen months old. The central incisors are then knocked out, or otherwise extracted, and whenever their places are occupied by permanent ones, the next two are removed, and after a short interval, the two corner ones also. In this way each pair of permanent incisors may be brought forward a year before their natural time, and all of them be up at four instead of five years old. The lower jaw only is in general looked at, in judging of the horse's age; but lest a cautious or suspicious purchaser might chance to examine the upper one also, the teeth in it are usually subjected to the same process; while the gums are freely lanced so as to hasten the appearance of the tushes. To detect and expose this deception is sometimes a matter of considerable difficulty. In the male, the absence of tushes or their small size may create suspicion; but in this, as in many other similar cases of doubt, the examination of the molars is the best way of arriving at a correct knowledge of the true age.

Every one who has had any thing to do with horses has heard of *bishopping*, so called from the gentleman who first brought the practice into notice. For the benefit of the uninitiated, it may be mentioned that it consists in reproducing as exactly as possible the mark or date found on the summit of the horse's incisors. This is effected by making an oval indentation with a graving instrument, and blackening the hollow with a hot iron or some chemical substance. But even when executed in the best of style, and by the cunning hand of a Yorkshire horse dealer, it requires little examination to distinguish the artificial date from the natural one. No art can imitate the ring of white enamel encircling and dipping into the hollow, and giving it a bright polished appearance, and no hand is sufficiently dexterous to form a date of the exact shape, which nature alone can mould, with its oval appearance, its anterior or outer edge perfectly

straight, its posterior or inner one perfectly rounded and its corners sharp. The most successful imitation falls far short of the original model, is rough and irregular in appearance, round instead of oval, without any difference in the curve of the anterior and posterior margins, and with rounded instead of sharp corners. There are some teeth which present unusual facilities for bishopping, and on which the operation is in consequence more frequently performed. This is especially the case with shell teeth, and with those in which the ring of enamel remains after the black mark has been worn away—a frequent occurrence in horses of the heavier breeds. In these cases the deception may be detected by the irregular appearance of the mark, and its being too much blackened or more certainly, by examining all the incisors above and below; for in most cases, one or two pairs of the teeth are alone subjected to the operation. Bishopping, however, is now much less common than it once was, and is chiefly confined to Yorkshire and the neighbouring counties. In Edinburgh and most parts of Scotlane, a bishopped mouth is seldom seen.

There is often observed in old horses a mark resembling the fading away of the true date, and occasionally mistaken for it. This second mark, as it is sometimes called, depends on the coming into wear of the fang or root of the tooth, which once contained the pulp, and which is now filled with secondary dentine, of a kind very soft and easily stained by the juices of the food. But scarcely any one who has ever examined the mouths of half-a-dozen horses could mistake this second mark for the true date. It is very irregular, almost perfectly round, and not encircled by any ring of enamel, and, farther, it occurs only in teeth having a very horizontal position, lying very close over each other, triangular in shape, yellow in colour, and with the other characters of the teeth of a horse after fifteen years old.

The teeth of the horse are little liable to disease. Occasionally, as in the human subject, the irruption of the teeth is attended with difficulty of mastication, fever, weeping eyes, and redness of the nasal mucous membranes; but the disturbance is only slight and of short duration. In horses, far more serious inconvenience is often produced by irregularity of the molar teeth, some of them projecting beyond their fellows, and injuring the gums and palate with which they come in contract. In the upper jaw these asperities and prominences are most common along the outer edge of the teeth, and in the lower jaw along the inner edge; while the posterior molar on either side below is very apt to grow higher than the others, and do much injury. These irregularities generally depend upon the upper jaw slightly overlapping the lower, and the two sets of teeth above and below not coming into direct opposition. From the pain the animal experiences in chewing, he either refuses to eat, or quids his food partially chewed; and whenever an animal is found doing so, and without any acceleration of the pulse or breathing, attention should at once be directed to the teeth; they should be carefully examined by the hand, which may be introduced into the mouth with perfect safety, if the jaws be kept separate by inserting betwixt them a metallic ring. Any irregularities are easily removed by a rasp, which ought to be slightly rounded, and attached to a long handle. An undue growth of the incisors occasionally occurs, produced, as in the molars, by the irregularity of contact and wear of the opposing teeth. When the incisors of the upper jaw project over those of the under, the animal is said to be *parrot billed.*

The incisors are occasionally broken, especially along their outer edge. This may result from various causes, as the natural softness and brittleness of the teeth, from hard feeding, or pasturing on heathy land, and is also often seen in crib-biters. But the natural hardness and solidity of the horse's teeth render fractures very rare and caries still rarer, and hence the animal is fortunately almost exempt from the evils of tooth-ache. Occasionally, however, disease attacks the fangs of the molar teeth, and speedily involves the bones adjacent, causing swelling of the face, difficulty of mastication, and quidding of food. In bad cases the thin plates of bones separating the teeth from the maxillary sinuses become absorbed; matter accumulates in these and the adjacent sinuses, and is poured from the nostrils at irregular intervals, forming a yellowish-white, flaky, fœtid discharge. In such circumstances, the tooth must be carefully cleaned out, and the diseased part removed; or it may at once be extracted with a pair of large forceps.

Cattle of mature age have 32 teeth, namely, 8 incisors, and 24 molars; they have no canine teeth.

There are two sets of incisors, a temporary and a permanent, and there are 8 teeth in each set. In cattle, and many other ruminating animals, the incisors are only found in the lower jaw. In the corresponding position above, there is a fibro-cartilaginous pad, against which the food is pressed by the teeth, and thus cut, torn, and divided, and so prepared for farther reduction by the molars. The incisors of cattle differ in many respects from those of the horse. They have a more horizontal position, so as not to injure the soft cartilaginous pad on which they move, are smaller and in every way less bulky, and have only one cutting edge, and no flattened summit. Their anterior surfaces are smooth, shining, rounded, and devoid of

grooves; their inner surfaces are less bright and smooth, for the enamel is laid on them less thickly than on the outside, and from their wearing more rapidly, the cutting edge is always kept sharp. Their necks and roots are small and triangular, and hence the teeth stand wide apart, and are always loose. From their being enabled to yield slightly, they are far less liable to fracture and concussion, than if they were perfectly firm and immovable. The days have not long passed since this natural looseness of the teeth of cattle was generally considered as an indication of disease, and attempts were often made to fix them more securely, by placing a large piece of wood or an anvil under the animal's head and driving in the teeth with a hammer.

The calf is born sometimes with four, and sometimes with six incisors: I think, however, that Youatt says there are only two up at birth. The number is certainly liable to some variation, according to the length of the period of gestation: but when the cow goes forty weeks with calf, the number I have mentioned will usually be found, and I have sometimes seen the whole eight incisors cut at birth. In general they are all up when the calf is a month old. They gradually become flatter and more triangular, and widely separated from one another. When the animal is eighteen months old, the two central teeth are displaced by two permanent ones, which are fully up when the animal completes its second year. At the close of each suceeding year, two temporary teeth are removed, and their places occupied by permanent ones, until at five years the corner ones appear, and the ox has then his full complement of eight permanent incisors. When they first come up they are often very crooked and irregular—but as they get more room by the expulsion of the temporary teeth, and the enlargement of the jaws, they gradually become straight and symmetrical. The permanent incisors are distinguished from the temporary ones by their larger size, darker appearance, and wider necks. There is some little variation in the times at which the teeth of the different breeds of cattle appear—those which come soonest to maturity getting their teeth some weeks earlier than those of more backward growth. The sort of food which the animals receive also alters somewhat the time of the irruption of the teeth; and if the temporary incisors be either accidentally or purposely removed before their regular time, the permanent ones come up sooner than they would otherwise do.

The molar teeth of cattle are of two kinds, temporary and permanent. There are twenty of the former and twenty-four of the latter, and both are arranged in four rows, one on either side above and below.

At birth, or shortly after, the calf has three molars on either side above and below. These occupy the first, second, and third places in each row. In six or eight months, the fourth temporary in each row is up, and at twelve months the fifth also, making in all twenty temporary molars. At this time, the first temporary one of each row is forced out by a permanent one which takes its place, and at intervals of a year a temporary tooth is displaced from each of the four rows, and its place occupied by a permanent one. The first, second, third, fourth, and fifth permanent molars in each row thus appear respectively at the ages of one, two, three, four, and five years; and at six—a year later than in the horse—the ox gets the sixth molar tooth in each row, and has then a full mouth. The permanent molar teeth of cattle are smaller and more oblong than those of the horse, are very rough and rugged, being crossed by prominent ridges, and are dark coloured and of a metallic lustre from the straining of the soft crusta petrosa. The three anterior ones of each row are smaller than the three posterior ones, and bear much resemblance to the incisors of the horse. It is somewhat difficult to remember the time at which the different sorts of teeth appear; but this is greatly facilitated by making a diagram of them, and attaching to each tooth the month or year in which it appears. After looking once or twice at such a diagram, it is easy to remember the time at which both incisors and molars appear, whether in horses or cattle.

The teeth of sheep are similar in number and distribution to those of cattle. The incisors (in proportion to the size of the animal) are longer, more convex, and more rounded anteriorly than those of oxen. They have a sharper oval cutting edge, and are farther projected, enabling the animal to crop even the shortest herbage. This is further facilitated by the cartilaginous pad being placed farther back than in cattle, and by the division of the upper lip, both of which admit of the teeth being brought into closer contact with the ground than in most other animals. The molars are sharp and rugged, of a dark appearance and metallic lustre. Both they and the incisors appear in the same years as the corresponding teeth in cattle, but usually several months earlier. The times of their irruption are liable, however, to more variation than in cattle, and often differ by several weeks in the different breeds and under different methods of feeding and management.—F. D.—North British Agriculturist.

REAPING MACHINES.

We do not seem to be yet destined to hear the last of the controversy on the subject of reaping machines. At Perth—in Yorkshire—at Cirencester—and again in Cleveland, decisions on the merits of the different competing implements are arrived at, each at variance with its predecessor and each other, and we are with another harvest left to decide which is the best; and whether any one is or is not to be generally useful to the farmers occupying ordinary farms, is a point by no means settled. All the trials have certainly shown that the mass of the implements brought forward are very liable to get out of order, will choke up, will throw themselves out of working order, and will break two or three times a day. And yet we would not on that account condemn them. It ought to be remembered that the bulk of the reapers were made at a time when there was no corn to test them upon, and hence the alterations called *improvements* have in several cases turned out failures, and have damaged instead of improving the implements; they have not strengthened the working parts, and therefore the machine blocked up and broke; and if they broke in a trial, in a few hours' work, how was the poor farmer to be situated who depended upon it to do the whole of his reaping on his farm, if it then showed a similar tendency? He could not have blacksmith and carpenter to attend it, to repair it, every day, or twice a day. All these are circumstances which certainly prevent a final decision on the abstract merits of the reaping machine as an agricultural implement. The *Economist*, however, takes the whole question as settled. It seems to start off with an idea which might possibly be founded on our remarks in a preceding *Journal* as to the relative cost of hand and machine reaping in *particular cases*, and says—"The saving in the cost of reaping by the best machines is equal to 2s. upon a quarter of wheat; the average cost of reaping in an ordinary way is at least 11s. for an acre. By the best machines, with practised hands, the whole cost does not reach 4s. an acre, being a saving of 7s., which, divided by the average production, is about 2s. per qr. Again, independent of the superior quality of the work, and the great advantage of dispatch, the saving by thrashing by the new machine cannot be computed at less than 2s. per qr.—some put it higher. Here then, in reaping and thrashing only, we have a saving of 4s. per qr. by an economy of production which is a gain to all, a loss to none."

Now, accurate as may be many of the figures of the *Economist*, it would be a great mistake to allow this tissue of errors to go forth at the present moment. He takes for granted the whole of the unsettled questions relative to the machine and its results, and then bases on the whole an unfounded assumption. We fear neither the data nor the conclusions are correct.

In the first place, which is the best machine? Until this be settled, no conclusion as to the precise saving can be at all arrived at—nay, all attempts to do so are utterly worthless. Then, to how very few of the acres of corn in the kingdom will the rule apply, admitting it to be correct! A saving of 7s. per acre is, however, quite impossible. There are thousands of acres of standing corn—the only corn on which the machine can be efficiently worked—harvested at a cost of no more than seven shillings. We have this year let some of the largest crops we ever saw, embracing from 45 to 48 bushels per acre, at seven and sixpence.

But there is a great variety of circumstances necessary to render the reaping machine at all available. Little as the trials have decided that can lead us to certainty as to their operations, they certainly have settled this much—that, to be efficient, the crop must be standing. We doubt not that they will cut laid or lodged corn—that is quite possible; but, it will not so cut it that it will be fit for tying or properly harvesting. Then, if there be any weeds (and there are few districts in the country where more or less do not grow), the machine will soon be at fault—will choke up, and be useless. Again, if the land is not level, there will be difficulty in making it work in a satisfactory manner; and the corn must be thoroughly dry; and a wet clay soil will clog the wheels.

Now, on how many acres of the country can all these requirements be at all times available? On some, never. We are therefore under the necessity of completely denying the two great facts of the *Economist*—assumed, as a matter of course, and quite fallacious—that either a best machine was found at all, or one which could save anything like seven shillings per acre; nor could its application, as at present, be at all general. While we hail the machine as a great boon; while we believe it may be useful when improved and adapted to our crops; while we think it quite probable it may be partially useful—and this is a great deal—we cannot endorse one opinion nor one conclusion of the *Economist*, for both the one and the other are erroneous in the

extreme, and calculated to mislead those who are not practically acquainted with the subject.

We may just, in reference to the question of the best machine, allude to a few of the most important trials. The first was at Tiptree, under the auspices of the jury of the Great Exhibition. It is declared by the American Minister that it was fairly tried. There M'Cormick's machine carried off the medal. A second trial followed at Middlesboro', and the jury unanimously, and it could admit of no question they were then and there right, reversed the decision, and awarded it to Hussey. The Yorkshire Agricultural Society tried it at Sheffield before highly competent judges, and again reversed it, giving the prize to M'Cormick. The Driffield Farmers' Club had another trial, in a district, of all others, favourable to the reaping machine, and again confirmed the decision in favour of M'Cormick. The Highland Society threw out both the one and the other, and decided in favour of one of Bell's; while the Cleveland Agricultural Society, the other day, after a very patient trial, gave again their verdict at Guisboro' in favour of Hussey's machine. Who can yet say which of them is the *best?*—Gardeners' and Farmers' Journal.

BRIDGENORTH INDUSTRIAL SCHOOLS AND GARDENS.

Five or six years ago the Guardians of the Bridgenorth Poor-law Union determined upon establishing an industrial school for the children that might come under their care. The plan was warmly supported and assisted by W. Wolryche Whitmore, Esquire, of Dudmaston; and as instruction in household duties for girls, and in agricultural labour for boys, was considered most expedient, a house and a few acres of land were taken for the purpose, in the parish of Quatt, between three and four miles distant from Bridgenorth. Owing to circumstances not necessary to state, the establishment, about a twelvemonth ago, ceased to belong exclusively to the Bridgenorth Union, and it is now denominated "The South-east Shropshire School." Children from other places are admitted, but the master and the system of instruction continue the same. The land taken in the first instance was about four acres of arable, and half an acre of meadow land; there is now attached to the school nine acres of arable and three acres of meadow land. The boys cultivate the land, attend to the cows, pigs, &c., and the girls are instructed in household work, sewing, baking, washing, and the dairy. The afternoons are wholly devoted to industrial labour, and the mornings chiefly to school instruction, in which the attainments of the children are very superior to those of most workhouse schools where no training exists. The number of children is fluctuating, but often considerable (sometimes 60 or more); it is not, however, an object to get rid of them as soon as possible, but to give them such an industrial training as may remove habits of idleness and incapacity, which are productive of future pauperism, and to facilitate the means of a permanent and independent livelihood when they leave the school. The nine acres of arable land are cultivated by the spade, and the crops upon it are mangold wurzel, swedes, carrots, rye grass, cabbage, and potatoes; the whole of which—(potatoes, as elsewhere this year excepted)—are abundant. The average weight of the crops are stated to have been, as near as may be, as follows:—Cabbage, 50 tons per acre; carrots, 20 to 25 tons; Swedes 30 tons; mangold wurzels, 30 to 40 tons; and potatoes, 300 bushels of 90lbs., or more than twelve tons. It is worthy of note, however, that this large produce is owing to the *quantity of liquid manure applied to the land*, which is derived from the drains of the house, together with all the refuse matter suitable for the purpose, collected in one large cesspool constructed to receive it, whence it is drawn out in pails as it is required. Five or six cows are kept, and a considerable quantity of butter is sold. Pigs are reared and sold. The articles supplied to the school are, of course, taken credit for in the school account. The rent is about £2 10s. per acre, to which is to be added interest of money expended in erecting the cowhouse, shed, tank, and enclosing and draining, and also the rates and other charges. In several years a profit had been made, but the expenses attendant upon bringing the increased quantity of land into order will, it is supposed, prevent this from being the case for the present and succeeding year. But it is not in this shape that a return is looked for; the object is, by implanting habits of industry in the children of paupers, and by imparting instruction, to place them in a position to obtain an independent subsistence, and thus prevent, as far as possible, any falling back into the position of their parents. In one word, the great end and aim of the establishment is, "depauperisation." On Friday last an educational examination of the boys and girls in the establishment took place, which attracted a distinguished company, principally from the immediate neighbourhood. Among the ladies and gentlemen present were W. W. Whitmore, Esq., Dunmaston Hall; the Very Rev. Dr. Dawes, Dean of Hereford; Jelinger C. Symons, Esq., Her Majesty's Inspector of Schools; Henry Whitmore, Esq., of Apley, M.P., and Lady;

Lady Louisa Whitmore and family; Joseph Anstice and Lady, Coalbrookdale; Thomas Pardoe Purton, Esq., and family, Faintree Hall. The examination took place in a large room attached to the premises; 21 boys and 13 or 14 girls taking their places for the purpose of being questioned by the examiners, who were the Rev. Dr. Dawes, Dean of Hereford, and the Rev. G. Bellett. Mr. W. W. Whitmore then said:—"As this is the first annual meeting since the formation of the district school, and as many may not understand the system, I shall venture to make a few remarks before beginning the examination. Our school is industrial. The boys work in the field; the girls do the household work; that is, they wash, sew, scour, iron, bake, and as far as our simple kitchen goes, cook. The boys cultivate nine or ten acres of land by the spade; they have one labourer to assist them, but all the rest of the work is done by them, including the feeding of pigs and cows. There are two classes of objections we are likely to meet with in this system: one, that we do not impart so much knowledge as is given in other schools; the other, that we impart too much, and thereby tend to impair the qualifications of the children for the harder and more laborious walks of life. Both have been alleged in relation to this school. In answer to the first, I should say we cannot expect to store the memory of children that pass half their day in work with so much knowledge as if the whole of their time were devoted to learning. But I am of opinion that what we do teach, we teach more thoroughly; that the intellect and reasoning powers are strengthened by their work, just as their health is improved, and their physical power more fully developed. The latter objection is, however, more frequent and more formidable. If we spoiled the children as labourers, we should do great harm, but I think we do not; I should be somewhat afraid of great apparent learning for the working class, if it were superficial and uncombined with regular habits of industry; but so combined, I apprehend you may give a considerable amount of useful knowledge. With respect to the boys, as yet we have not so active a demand, but I have no fear of their remaining long on hand. That they work well is, I think, proved by two or three facts I will mention. On the first formation of the district school, and the addition of six acres of land to what we previously cultivated, Mr. Garland estimated that three boys per acre able to dig would be required; we have, however, never had much more than half that number; that is, our gang has never exceeded from 12 to 15 in lieu of 30, and yet the ground has been cultivated in a most satisfactory manner. There is nothing wasted or unoccupied in it: no sooner is one crop off than another is put in its place. Manure, especially in a liquid form, has been liberally applied, and no weeds are to be seen. Were it not that two of our crops have failed, from causes against which no caution or labour could guard—our potatoes and carrots—the one from that fearful disease which seems to menace permanently the future use of this valuable root, the other from wireworm, we should, I think, have been able to exhibit our ground against any other of similar extent, however cultivated."—Morning Post.

CALENDAR OF HORTICULTURE.

Plant-Houses.

It is now quite time to get green-house and conservatory plants of all sorts housed in their winter quarters—choose a fine day for the operation, and let the plants be perfectly dry; take off all decayed leaves, tie up straggling growths, root out weeds, and, if necessary, give the plants a top-dressing. If the conservatory has had a thorough revision, such as cutting-in climbers, forking-up borders, &c., the most desirable plants should be selected to make good all deficiencies in that house, but be careful to avoid overcrowding. Large plants in pots may, with great advantage, be sunk into the border; overcrowding must also be avoided in every other structure where plants are stored for the winter. It is far better at this season to throw away the worst of the stock than run the risk of injuring the best plants. Favourite sorts will be better replaced by young plants in the spring. In arranging the plants in the mixed green-house, some regard must be paid to the state of the growth of the plants at the time of housing, as it is not to be expected that all will be gone to rest alike; on the contrary, some will still be growing, and in that case they will require to have the best situations selected for them, so that they can get a good supply of sunlight and air, to perfect the growth, after which the quantity of water must be gradually lessened; but observe that with hard-wooded plants there is a point beyond which water must not be withheld. In fact I may here observe, that with such plants, watering, for the next four or five months, will be the most important operation connected with them. They are, or soon ought to be, in a state of rest, and of course require no more water than is necessary to preserve their vitality; and it is their artificial condition, by having the roots confined in a pot, which renders this the more difficult, because, under such circumstances, the equability of temperature about the roots, so necessary to their well-being, cannot be kept up, and not only varies with the changes of temperature to which the circumfluent atmosphere is subject, but in consequence of the porosity of the pots, moisture is con-

tinually escaping from the roots, which is an artificial condition. The greatest safeguard is the most perfect drainage. If the water passes freely though slowly away, the plant is safe; if it stagnates, there is danger. I like a plant, even in a perfect state of rest, to want water once a-week. Of course these remarks apply to hard-wooded plants; with such as are of a more succulent nature, a much greater latitude may be taken, and anything short of positive dryness will not injure them. There is another point to be attended to in arranging the plants, which is, to take care that such plants as Leschenaultias, Aphelexes, Polygalias, Boronias, Pimeleas, Crowæas, Dracophylums, are not so placed as to be subjected to any cold and cutting draughts of wind, which we may now soon expect. It is a good plan to keep such like plants at one end by themselves, so that they may only have a free circulation of air in calm fine weather.

Forcing-Houses.

Pineries.—As the influence of the sun becomes lessened, the interior temperature must be gradually lowered. Air, however, must be carefully admitted, according to external circumstances. Open the ventilators as early as possible in the morning, and close early, so as to shut up plenty of solar heat. Stir up the surface of the bed of plunging materials, and syringe over it and about the lower parts of the plants, but by no means over-head. The bottom heat may be allowed to decline a point or two for the succession plants, but fruiters will require to have it maintained from 85 to 90 deg. A drier atmosphere in general must now be aimed at, in order to assist the plants which have made their growth to go to rest for a time.

Vineries.—Continue to pay every attention to the late houses carrying fruit, as their greatest enemy at this time is a damp atmosphere. Fires must be occasionally lighted, taking care at the same time to admit air liberally, otherwise too much heat will induce the berries to shrivel. Keep all decaying berries constantly cut out.

Peach-Houses.—The whole of these will now have the wood well ripened, and the leaves may be all brushed off, and the shoots loosened from the trellis. If the practice has been to remove the lights for a month or two, it may be done at once, but I do not advocate the practice; still, I would let down the moveable lights, and take off the ropes, and open all the front ventilators. Take an early opportunity to put the houses in thorough repair, but leave the whitewashing until they are closed.

Pits and Frames.—Great care must be used to keep up a kindly bottom-heat to Cucumbers, whether obtained from pipes or by means of fermented dung. Let them be double-matted at night, but open early, and give a little air to dissipate stagnated moisture. Melons will also require a kindly bottom-heat, but care must be had to keep a tolerably dry atmosphere about them, or else they will be little better than gourds.

Flower-Garden.

Many things to supply the wants of another season still remain to be propagated, and amongst them I would recommend that a nice place should be selected under a north wall, filled with light porous soil, and a few handlights to be placed thereon, to be filled with cuttings of the different varieties of Calceolarias for bedding-out, such as Kentish Hero, Kayii, Viscosissima, Sultan, Angustifolia, Rugosa, and Thyrsiflora: they will only require protection in very severe weather, and will furnish a most abundant supply of plants next year. Put in more store pots of Verbenas—the smallest cuttings are best, two joints being plenty. Use plenty of silver sand—I never had a finer stock of bedding stuff than this year, and the whole were struck and preserved through the winter in silver sand alone, with good drainage, and a layer of moss to prevent the sand from percolating away. Strict attention to neatness is very desirable at this season, when we are naturally anxious to prolong the beauty of the flower garden. Continue, therefore, the constant removal of all decaying matter, as well as staking and tying all autumn flowering plants. Pay attention to late-budded Roses, by the removal of bandages, and slightly shortening top-heavy plants. Cuttings of Chinese, Hybrid, Bourbon, and many perpetual roses may now be put in under handlights, in the shade of a north wall, or they may be put in store-pots, and kept through the winter in a cold pit.

Kitchen Garden.

Continue the earthing-up of Celery whenever the foliage is dry. Thin-out late Turnips, and make a sowing in light soil to come on in the spring. Sow Radishes and small salading for late purposes. Tie up Endive and Bath Cos Lettuce for blanching, but be sure to do so only when they are perfectly dry. Plant out a good breadth of Cabbage for early spring use, and prick out the last sowing thickly in nursery beds. Prick out the seedling plants of Walcheren and other Cauliflowers, in frames, and select, enrich, and trench-up a nice piece for hand-lights, to be planted in about a fortnight or three weeks since. Manure and trench-up all vacant ground, laying it up as rough as possible. Keep the surface-soil well stirred amongst all advancing crops, such as Spinach, autumn Cabbage, and the Brassica tribe generally. Sow a few Carrots in a sheltered situation, and before sowing prick in a layer of quick lime.

ROPY BEER.

In reply to a query for the cure of ropy beer, we have received the following answers:—

"M. J. K." advises, for a vessel of 36 gallons, the simple remedy of suspending, midway of the barrel of beer, 2 oz. of flour of mustard from the bung-hole, in a fine muslin bag.

"W. D." writes as follows:—For a vessel of 50 gallons, take a quarter of a pound of mustard, mixed with beer, and a large handful of hyssop: tie to the hyssop a stone, to keep it about half-way down in the barrel; and also a piece of string which should be carried through the bung-hole, and attached to a weight on the top of the barrel: stir it well with a stick for a quarter of an hour; bung it down close, and it will be ready for use in 10 days.

"E. B." says, Take a bunch of *hyssop*, about the size of the *bung-hole*, tie it with string, long enough to *sink half down* the *cask*, is sure to cure in a few days.

METEOROLOGICAL DIARY.

Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weath.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Aug. 24	30.24	30.08	58	70	60	S. Westerly	gusty	cloudy	cloudy	cloudy	shower
25	29.98	29.98	58	72	63	W. by South	lvly. st.	cloudy	sun	fine	dry
26	30.01	30.04	60	70	62	S. Easterly	lvly. st.	cloudy	sun	fine	dry
27	30.11	30.12	59	76	64	E. by North	lvly. st.	cloudy	sun	fine	dry
28	30.11	30.02	58	74	62	S. or by W.	lively	fog	sun	fine	dry
29	30.01	30.02	60	73	60	Westerly	gentle	fine	sun	fine	dry
30	30.03	30.03	57	67	56	S. West	lively	fine	sun	fine	dry
31	30.04	30.07	53	66	55	S. West	lively	fine	sun	fine	dry
Sept. 1	30.10	30.19	54	69	59	S. S. W.	lively	cloudy	sun	fine	rain
2	30.21	30.20	49	71	58	N. W., var.	gentle	fine	sun	fine	dry
3	30.21	30.16	52	71	61	S. East	gentle	haze	sun	fine	dry
4	30.13	30.10	55	70	61	S. Easterly	gentle	fog	sun	fine	dry
5	30.06	29.97	58	71	61	S. E., S. W.	calm	fog	cloudy	cloudy	rain
6	29.98	29.98	58	67	59	N. West	gentle	fog	cloudy	cloudy	rain
7	29.97	29.94	56	66	59	Every way	calm	fog	cloudy	cloudy	rain
8	29.98	30.00	58	64	60	Easterly	brisk	cloudy	cloudy	cloudy	rain
9	29.95	29.90	57	65	60	N. by East	brisk	cloudy	cloudy	fine	rain
10	29.90	29.80	59	65	60	N. by East	lively	cloudy	cloudy	fine	dry
11	29.84	29.88	56	66	54	N. West	lively	cloudy	sun	fine	dry
12	29.88	29.92	50	66	55	N. N. W.	gentle	fine	sun	cloudy	dry
13	29.93	29.94	49	68	56	W. N. W.	gentle	fine	sun	cloudy	dry
14	29.94	29.83	50	62	54	W. N. W.	very gl.	fine	sun	cloudy	dry
15	29.62	29.40	50	56	50	S. by West	gentle	cloudy	cloudy	cloudy	rain
16	29.65	29.86	—	60	45	N. by E. by W.	gentle	cloudy	sun	fine	dry
17	29.84	29.83	39	58	48	N.E., E. by S.	gentle	fine	sun	fine	dry
18	29.62	29.28	44	62	56	Sthly., S.by W.	lively	cloudy	cloudy	fine	rain
19	29.27	29.64	55	56	53	N. Westerly	calm	cloudy	cloudy	cloudy	rain
20	29.64	29.52	49	60	50	S. Westerly	breath	cloudy	cloudy	fine	rain
21	29.62	30.20	46	58	44	Westrly., N.W.	varibl.	cloudy	cloudy	fine	rain
22	30.35	30.14	37	60	51	West by N.	gentle	fine	sun	fine	dry

ESTIMATED AVERAGES OF SEPTEMBER.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean.
30.410	29.410	70	36	57.8

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
65.66	52.80	59.073

Weather and Phenomena.

August 24—Rapid change; smart shower, soaking the corn in shock. 25—Lunar halo; calm evening. 26—Cheerful harvest day. 27—Fine; hot sun; lively drying air. 28—Fine harvest day, after haze. 29—Warm sunny day. 30—Cooler, with lively air. 31—A few drops; weather becomes more settled; corn harvest nearly completed.

Lunation.—Full moon, 20th day, 3 h. 6 m. afternoon.

September 1—Cloudy masses, elevated; clearing; a few drops. 2—Brilliant, after morning haze. 3—Splendid. 4—Fine; masses and stratus clouds. 5—A rainbow in East. 6—Changeable; heavy clouds, and wet night. 7—Gloom; thunder clouds; rainy night. 8—Improved; one shower. 9—Thunder early; much rain; fine evening. 10—Forcible east wind; mist; soft and mild as western breezes. 11, 12—Both fine and sunny days. 13—Heavy clouds; alternate gleams. 14—Fine morning; dark cirro-stratus clouds at sunset. 15—Showers; very chilly. 16—Fine drying day; luminous northern horizon on both nights. 17—Strong dew; cold morning; sunny day. 18—Soaking rain for hours; lull at sunset. 19—Overcast; drizzle. 20—Nearly calm; close; superb rainbow. 21—Hint of rain; cold and cheerless; fine, after glowing red sunset. 22—Frosty dew; warm sun; balmy and beautiful day. Equinox at 9 h. 41 m. in the evening. Hybernal indication, may be a fine and quiet season, perhaps rather keen, but undisturbed by storms.

Lunation.—Last quarter, 6th day, 6 h. 34 m.

afternoon. New moon, 13th day, 10h. 38m. afternoon. First quarter, 20th day, 1 h. 17 m. afternoon.

Remarks connected with Agriculture. —Our harvest may be said to have been concluded in the first week of the ninth month. The homesteads and rick-yards make a great display; but, as some adverse circumstances occurred, it would be premature to hazard assertions as to quality and bulk of grain. The roots and green crops are very promising, and the winter supply of fodder is likely to prove ample. Hops appear to be very superior, and the now fine weather is highly favourable. I regret the blank in the table of temperature; the figure may be estimated at 40° min.

Croydon, Sept. 23rd. J. Towers.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR SEPTEMBER.

Harvest work having been generally concluded in England, we are now in a position to write in more definite terms in reference to the produce of the crops. In the first place, it is obvious that many severe losses have been sustained by the wheat growers in the whole of the forward districts, arising from the heavy rains which fell during the month of August, and the protracted period to which the harvest was prolonged, owing to the numerous interruptions experienced in securing the grain. We speak within bounds, when we observe that nearly one-third of the wheats have been stacked in bad condition, and that the loss of good saleable parcels has exceeded one million quarters. Prior to the commencement of last month, the prospect presented by the fields was unusually promising, and, had the weather continued propitious, very little doubt was entertained that the yield would have proved quite equal to last season. As it is, we incline to the opinion—after making due allowance for losses by mildew, blight, &c.—that nearly, or quite, an average *quantity* has been grown. Many parties appear to consider that, as the stocks of old wheat are now exhausted, and that as our markets must of necessity be very moderately supplied with fine new wheats for some considerable period, prices are likely to advance; but they must bear in mind that the produce of the crops north of the Humber has turned out much better than in the south, and, further, that the yield both in Ireland and Scotland is good. Open ports forbid the possibility of scarcity; hence, it is evident that any improvement in present rates is wholly out of the question. An unusually large crop of barley has been grown; indeed, with very few exceptions, it is by far the best ever recollected. Oats are, likewise, turning out well; but both beans and peas, especially the former, are very deficient. Up to the present time, the quantity of grain thrashed out is small; yet it is sufficiently large to afford us a full opportunity of fairly testing its weight and condition.

Numerous conflicting statements have reached us on the subject of the potato crop. Many of the growers have asserted that the losses from disease are unusually heavy; others, that they are comparatively small. That disease is to be met with to some extent in some districts is evident; but we must not forget the important fact that the extent of land under culture this season is very large; hence, it is probable—as was the case last season—that we shall have a larger supply of potatoes for winter use than has been anticipated. Up to the middle of August—about which time the haulm commenced decaying—the latter sorts continued unusually small in size; but it is gratifying to observe that, since that period, they have progressed rapidly. The numerous samples submitted to our notice from Essex, Kent, &c., within the past fortnight, lead us to hope that the aggregate growth will be quite an average one. From abroad about 100 tons have reached us; but we have every reason to know that the total imports in the course of the winter will be comparatively small. The prices paid for Regents have varied from 85s. to 100s.; Shaws, 75s. to 95s.; and other sotrs, 35s. to 60s. per ton.

The growth of fruit has proved a most abundant one. In the cider districts apples are exceedingly abundant and cheap. On all hands it is admitted that the turnip and carrot crops are proving large; in fact, we never recollect to have seen them heavier than at present. The quotations are, therefore, ruling low. An immense quantity of pasture-grass is to be met with in each of our leading counties, and the produce of the second cut of both meadow and clover hay has exceeded all previous calculations; hence the supplies now on hand are fully equal to 1851. Prices have fluctuated to some extent, a considerable rise having taken place in them at the commencement of the month; but they have since receded to about their former level.

Hop picking has progressed rapidly in Sussex, Kent, and elsewhere. Very large supplies of hops have appeared in the Borough, and been partly disposed of, at comparatively low prices. As the

growth is unusually large, the duty has been estimated as high as from £245,000 to £250,000, against £110,000 to £115,000 last year. It is thought, however, that it is backed too high; yet, on the other hand, hops have come down well, and of good colour.

The growth of seeds has been rather an abundant one; but the demand for the new crop has hitherto been confined to actual wants. At one time winter tares commanded a high, but it has since given way materially. The imports of linseed during the present year will be little short of 400,000 quarters; yet crushers in general have purchased rather extensively, and prices have been well supported. The use of cake is evidently not increasing, and hence we have had to remark upon the unusually bad condition in which the stock has been received up to the various markets. No doubt, if time had been permitted, we should have seen an improvement in it; but the prevailing fashion of disposing of both beasts and sheep prematurely ripe, operates, in our opinion, against not only the graziers' interests, but likewise the produce of the land.

In Ireland and Scotland agricultural affairs are comparatively prosperous. Both store and fat stock has commanded remunerative prices, and the crops in general have been secured in fair condition.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the quantity of stock on most farms is quite equal to former seasons, comparatively high prices have been paid for store animals during the whole of the month. The plentiful supply of pasture food, and the favourable state of the weather, have induced great firmness on the part of the owners of lean beasts and sheep, whilst the late advance in the value of fat stock has induced great caution on the part of buyers, under the impression that present currencies are not safe. It has been a pretty general subject of remark that the consumption of animal food is considerably larger than at any period within the memory of man, even though emigration is increasing. That the shipment of some thousands of our population is calculated to produce a better demand for each kind of food, and consequently afford a better return to the producers, is very apparent. For instance, how many of those who have lately found their way to Australia, Canada, and the United States were ever good customers either to the baker or butcher? And is it not well known that, in many districts, we have been suffering from a redundancy of labour? The exodus, then, so far from diminishing the demand for the necessaries of life, is likely to improve it to an important extent, because labour is now likely to meet its reward, and every inhabitant of these islands has the reasonable prospect before him of enjoying an additional supply of good food, so essential to existence. Again, every vessel sailing from our shores must be supplied with beef, pork, bread, &c., for consumption on the voyage; and this, be it observed, is no trifling item taken in the aggregate. Fluctuations in prices will, of course, continue; but our decided impression is that we shall never again see so low a range in the value of either beasts or sheep as was the case during the greater portion of 1851.

The lean condition of most of the beasts derived from the northern districts for the metropolitan market has been productive of many inquiries respecting the cause. Since the commencement of the season, at least a moiety of them have arrived in very middling condition, and sold at corresponding quotations. We attribute this deficiency of condition solely to the long drought experienced during the early part of the present year, and the unusually small quantitities of oilcake consumed upon most farms. The falling off in the supply of rough fat has not been without its effect upon the Tallow market, the prices of which have risen 2s. per cwt., with a fair chance of the holders obtaining even higher rates.

With the exception of Monday, the 27th, on which day not less than 6,286 beasts were brought forward, and which were with difficulty disposed of at a reduction of 4d. per 8lbs., the general demand in Smithfield has ruled steady, but the salesmen have had to encounter immense imports from abroad in fair average condition, and which, in many instances, have changed hands at low figures. As it appears necessary to give the value of foreign stock, we may intimate that the Dutch beasts have sold at from 2s. to, in some instances, 3s. 4d.; sheep, 2s. 4d. to 3s. 8d.; lambs, 3s. 6d. to 4s. 6d.; calves, 2s. 6d. to 3s. 6d.; and pigs, 1s. 10d. to 2s. 2d. per 8lbs. The shipping season from the continental ports will soon be over; but, owing to the great facilities afforded by steam communication, we shall doubtless continue to receive small supplies during the winter months. We perceive that some newspaper reports refer to large numbers of Spanish sheep having been sold in Smithfield this season; but we may observe that not a single importation has taken place from Spain since June, 1851. Merino sheep have come to hand from Hamburgh every week since the beginning of March; but we are not likely to receive any further supplies either from Corunna or Santander, from whence they are usually shipped. It is somewhat remarkable that nearly the whole of the foreign stock imported into London is on account of Jews, some of whom sell a portion themselves in the

market, and distribute the remainder amongst the regular salesmen, who charge the same amount of commission as upon English stock; whilst we have not heard of a single transaction for grazing purposes, the whole of the beasts, sheep, lambs, calves, and pigs having passed direct into the hands of the butchers for slaughtering purposes. Although the value of stock, as well as of food, in Holland is higher now than it has been for a series of years past, and no important rise has taken place in it here, we understand that a large profit—certainly equal to from 12 to 15 per cent.—continues to be realized by the importers. As the stock in general continues to "die" well—*i. e.*, carry a full average quantity of internal fat—very little difficulty has been experienced in finding purchasers for it.

The imports into London have been as under:—

	Head.
Beasts	6,619
Sheep	34,759
Lambs	1,132
Calves	2,388
Pigs	1,847

COMPARISON OF IMPORTS.

Sept.	Beasts	Sheep	Lambs	Calves	Pigs.
1851....	6,177	28,566	2,075	2,518	1994
1850....	5,556	19,802	1,939	1,819	752
1849....	4,214	17,649	734	734	528
1848....	4,301	18,000	3,681	1,625	55
1847....	4,000	14,000	683	1,362	270

The total supplies shewn in the metropolitan market—including those given above—are as follows:—

	Head.
Beasts	24,911
Cows	490
Sheep and lambs	148,680
Calves	2,924
Pigs	2,980

COMPARISON OF SUPPLIES.

	Sept. 1848.	Sept. 1849.	Sept. 1850.	Sept. 1851.
Beasts....	21,714	19,868	22,212	23,007
Cows	421	447	475	600
Sheep and lambs..	161,230	168,350	173,450	169,390
Calves ..	2,707	2,080	2,491	2,220
Pigs	3,153	1,957	2,639	3,447

In glancing at the above comparison one might be led to the conclusion that the consumption of meat in London is falling off, or, at all events, that it does not keep pace with our increased population; but it is well known that the arrivals from various parts of the country, as well as from Scotland, have been on a very extensive scale.

From the northern grazing districts about 11,000 shorthorns have been reported; whilst the supply from other parts of England has been confined to 2,180 Herefords, runts, Devons, &c.; and from Scotland 390 horned and polled Scots, chiefly by steamers.

Beef has sold at from 2s. to 4s.; mutton, 3s. to 4s. 6d.; veal, 2s.10d. to 4s. 2d.; and pork, 2s. 10d. to 3s. 10d. per 8lbs., to sink the offals.

COMPARISON OF PRICES.

	Sept., 1848.	Sept., 1849.
	s. d. s. d.	s. d. s. d.
Beef .. from	2 6 to 4 0	2 10 to 3 10
Mutton	3 4 to 5 0	2 10 to 4 0
Veal.....	3 2 to 4 2	3 0 to 3 6
Pork	3 10 to 5 0	3 2 to 4 2
	Sept., 1850.	Sept., 1851.
	s. d. s. d.	s. d. s. d.
Beef .. from	2 4 to 3 8	2 2 to 3 6
Mutton	3 2 to 4 0	2 8 to 4 0
Veal.....	2 10 to 3 8	2 8 to 3 8
Pork	3 2 to 4 0	2 4 to 3 8

Newgate and Leadenhall markets have been seasonably well supplied with both town and country-killed meat, in which a fair amount of business has been transacted. Beef has sold at from 2s. 2d. to 3s. 6d.; mutton, 2s. 8d. to 4s. 2d.; veal 3s. to 4s. 2d.; and pork 2s. 10d. to 3s. 10d. per 8lbs., by the carcass.

The health of the depastured and stall-fed beasts and sheep has been good, and very few losses have been sustained by the graziers.

DURHAM.

Harvest commenced very generally in this county on the 18th of August. The summer has been remarkably forcing, and corn ripened with the greatest rapidity. Labourers have been exceedingly scarce, it has been quite impossible to procure sufficient hands to keep pace with the harvest, at high and exorbitant wages; indeed it has been the most expensive one we ever remember; but it is gratifying in being enabled to state it has been short, and Providence has favoured us with splendid weather; the crops are abundant, and secured in fine condition, and fit for the market at any time. On the rich and well-cultivated soils, where the grain was lodged as if it had been rolled, at so early a period of the season, the quality is very inferior and yield deficient. There are many situations where the laid crops are grown up through, and nothing but rotten straw; upon the poor and less productive soils we never experienced them so good, and will, we think, compensate for the deficiency upon the best land. High farming is highly recommended by many, but there is nothing more hazardous, when it is productive of such abundance, and your crops are worthless. June was a cold and wet month, scarcely ever having two fair days together. On the 5th of July we experienced one of the most awful thunder-storms ever remembered by the oldest person living; many accidents and loss of life was the consequence. The storm was most awful and destructive, the loss of property and injury to the crops were considerable, the turnips on hilly ground were swept away, and in low situations they were deluged with hail and rain. The heat during the month was intense and overpowering. The crops of wheat and quality will be various, but amounting nearly to an average; oats and barley a full average; beans and peas not much grown. The potato crop is badly spoken, the disease being worse than last year; the turnips were promising, but they

are much affected by fingers and toes, and in many situations they have all run to seed, which may be attributed to early sowing. From the humidity of the season grass and aftermaths are plentiful and luxuriant, which causes stock of every description to have an upward tendency at our markets. Wool is also looking upwards. We have had several trials of reaping machines, but they have not been very successful; they will have to undergo great improvement before they become generally useful.—Sept. 24th.

EDINBURGHSHIRE.

It is now our pleasing duty to report the conclusion (with a few trifling exceptions) of the harvest, which has been carried on and concluded under very favourable circumstances. Never in our recollection was the harvest in the moorlands, and on the hill sides, so close on the heels of that in the earliest districts along the coast, and the low-lying valleys; and, at the same time, we never remember the quality of the crops in the one approaching so near that of the other: and the general result is, as fine a crop as could be wished for, rising very considerably in our estimation above an average. We are aware that in some deep, loamy, much sheltered fields there was a little blight in the wheat crop, and that in the early districts the rain we experienced in the second week of August was productive of some injury by discolouring the grain, and causing a partial sprout, where it had stood for any length of time in the stook. But the succeeding dry weather did much to counteract the effect of the rains, and by taking exception to a few isolated crops, which might have suffered to a certain extent from the causes referred to, we have every confidence and much pleasure in stating the aggregate result as above. Wheat has proved an excellent crop, as tested on the barn floor, almost universally as regards quantity, and generally of good quality. We have heard of some crops yielding as much as seven and eight quarters per imperial acre (nine and ten quarters per Scotch acre), and have seen several samples weighing 65 to 65½lbs. per bushel; but we believe we are pretty near a correct estimate if we put down the average produce of this crop over the county at six quarters per Scotch acre, or about 4¾ quarters per imperial acre, and the weight per bushel at 62 to 63lbs. Barley is also a very fine crop in point of quality; it also weighs well per bushel, but is not quite so bright in sample as we have seen or could desire. We estimate the average of this crop at about 7½ quarters per Scotch acre, and the weight per bushel at 54 to 56lbs. Oats are a fair crop, but we think not over an average; the quality is however fine, and they weigh 40 to 44lbs. per bushel. Beans are not yet all secure, and as none have come to market, we refrain from reporting on this crop. We must now advert to the potato crop, and we wish it were in our power to speak as favourably of it as of the cereal crops; but alas, we have here to tell a sorrowful tale. There is certainly not a sound crop, judging from the stems and leaves throughout the length and breadth of the county, I believe I may say Scotland, and we know too well that the damage done at the roots is both general and great. The proportion of tubers already affected seems to vary from ⅛ to ⅞ of the crop, and from all we can learn there is no doubt whatever but one half of the crop is already lost; and as the disease is still spreading, we have very little hope for the safety of the other half. Various means have been tried to avert or mitigate the loss, such as pulling or cutting the stalks, lifting and pitting the crop before the usual time; but all seems unavailing. This mysterious disease, like others of its kind, comes secretly amongst us in the midst of our best prospects, armed with the highest authority to perform its fearful work of disaster and destruction, and defies the powerful engines of science and art, though directed with the maximum of human skill, to avert or mitigate its giant and unseen power. We are sorry we cannot speak so favourably of the turnip crop as we were enabled to do on former occasions; we now find it suffering from the disease known by "fingers and toes," mildew, a rotting of the bulbs, and running to seed. And from the combined effects of these maladies, we fear this crop, which at one time promised to be a superabundant one, will now fall below an average. We are sorry to observe, that after so much has been said and written regarding the desirableness of having guano reduced in price, there is now no prospect of this being accomplished to serve the farmer during the coming year. The Peruvian government, it appears, have fixed their price at the same figure as in former years, and the conditions, if anything, are more unfavourable, especially as regards taking delivery from the import ships. The second crop of clover is good, and affords much nourishing food to cattle at this season, and preparing them nicely for being put on turnips. Grain markets have been firm, in consequence of the injury done to the corn crops in the South of England by blight and sprout, and the general failure in the potato crop. We are of opinion that prices will rule a shade higher in the coming season than for two or three years past. When we supply from our corn crop the deficiency in our potato crop, we believe that considerably less than an average will remain for the ordinary purposes to which it is applied; and although the crops in Germany, Denmark, and America are likely to spare us a considerable surplus, we do not expect more than an average importation, for we must bear in mind that nothing of consequence need be expected from France, and under these circumstances we think ourselves fully justified in anticipating the range of prices to be a little over those of the last three years. The stock markets that have been held of late, have been very animated, and prices are now approaching exorbitant rates. At Falkirk Tryst, held last week, the supply of stock was quite inadequate to the demand, and the business done was at an advance of 15 to 20 per cent. on the current prices at the corresponding market last year. There has been a very considerable demand for stock, both sheep and cattle, on Irish account. And this circumstance, together with the fine appearance of the turnip crop (recently with some exceptions), may explain the disparity between supply and demand. In the mean time the pastoral farmers are reaping a rich harvest, and one effect will be to create great competition for hill farms, at advancing rentals. We trust for both landlord and tenant this will not be overdone.—Sept. 20.

SALE OF THE KILLERBY SHORT-HORNS.

We have seldom had to record an event that has been looked forward to with greater interest by breeders of short-horns than the dispersion of this valuable herd of cattle, which took place on Tuesday, the 21st July. It is now about sixty years since the foundation of the herd was laid by the late Mr. Booth, from the stock of Messrs. R. and C. Colling, beginning with the following bulls:—Twin brother to Ben (660), Suwarrow (636), Albion (14), and Pilot (496), the two last of which he purchased at the Messrs. Colling's sales. The blood of many other well known animals has been infused into the herd, including that of the bull Comet, which was sold at Mr. Charles Colling's sale for 1,000 guineas. The names of Bracelet, Necklace, Mantilini, Birthday, Gem, Hamlet, &c., are familiar to all who have during the last few years taken an interest in the breed of short-horns, or attended the meeting of the Royal English, the Highland, the Yorkshire, and other agricultural societies. Bracelet and Necklace were twin sisters; the former was the winner of 17, and the latter of 20 prizes. Necklace was exhibited for the last time at the Smithfield Club Show in 1846, where she gained the first prize in her class, as well as the silver medal for the breeder, and the gold medal (for which there were 37 competitors) given to the best female animal in the yard. The same prizes were obtained in the following year by Mr. Willey, and in 1849 by Mr. Cartwright, both animals being bred from the Killerby stock. Mantilini was the winner of 12, and Birthday of 10 prizes. Since the formation of the Royal Agricultural Society of England, in 1839, the prize given for the best cow has been gained either by the Messrs. Booth or by animals bred from their stock, with the exception of the two first meetings, when they did not exhibit, and that of 1843. The animals which took the prizes on the two former occasions were both afterwards exhibited against, and defeated by, Bracelet. At the meetings of the Royal Agricultural Society at Lewes, and of the Yorkshire Society at Sheffield, during the present year, the herd maintained its high position.

The sale was very numerously attended by breeders of short-horns from all parts of England, as well as Scotland and

Ireland. The celebrity of the herd likewise induced many gentlemen not immediately connected with agricultural pursuits to attend the sale. Among the company we noticed Sir W. Lawson, Bart., J. H. Fawkes, Esq., Captain Dilke, Timothy Hutton, Esq., Colonel Hudson, Rev. H. J. Duncombe, Rev. F. Thursby, John Aylman, Esq., Capt. Pierce, Dr. Fimm, Wm. Mauleverer, Esq., J. C. May, Esq., Captain Colling, B. Eastwood, Esq., Wm. Torr, Esq., J. Featherstonhaugh, Esq., R. Chaloner, Esq., H. Ambler, Esq., James Douglas, Esq., &c.

An excellent luncheon was provided by Mr. Booth for his visitors; and among the decorations of the room in which it was served were portraits of Comet, Bracelet, and other choice specimens of short-horns. Mr. Wetherell, of Durham, so long known as an eminent salesman of short-horned cattle, acted as auctioneer with his usual ability. After reading the conditions of sale, and making a few remarks on the herd he was about to dispose of, Mr. Wetherell proceeded with the sale. The bidding was very spirited. The cows and heifers, 34 in number, realized 1,555 guineas. Venus Victrix brought the highest price, and was purchased by Mr. Chaloner, of Kingsford, Moynalty, Ireland, for 175 guineas. The bulls and bull-calves, 10 in number, realized 482 guineas. The proceeds of the sale for the 44 head amounted to about £2,140. The following is the result of the sale:

COWS AND HEIFERS.

PREJUDICE, red and white, calved February 10th, 1844, got by Diamond, 5918; 30 guineas, to Mr. Manleverer.

SYLPHIDE, red and white, calved February 16th, 1845, got by Morning Star, 6223; 44 guineas, to Mr. Torr.

BONNET, red and white, calved April 12th, 1844, got by Buckingham, 3239; 41 guineas, to Mr. Anderson.

BLOOM, roan, calved February 1st, 1846, by Buckingham, 3239; 110 guineas, to Mr. Ambler.

MANILLE, roan, calved March 8th, 1847, got by Brigadier, 7849; 32 guineas, to Mr. Fawkes.

GERTRUDE, roan, calved April 29th, 1848, got by Lord George, 10439; 47 guineas, to Mr. Thursby.

EDITH, roan, calved June 6th, 1848, got by Exquisite, 8048; 51 guineas, to Captain Dilke.

BIRTHRIGHT, white, calved November 12th, 1848, got by Hamlet, 8126; 105 guineas, to Mr. Douglas.

JANET, red and white, calved November 21st, 1848, got by Landlord, 10400; 40 guineas, to Mr. Fetherstonhaugh.

LITTLE FANNY, roan, calved August 14th, 1848, got by Exquisite, 8048; 36 guineas, to Mr. Bate.

MOTHER RED CUP, red, calved November 6th, 1847, got by Hamlet, 8126; 37 guineas, to Mr. Fawkes.

SUNRISE, red and white, calved in 1845, got by Morning Star, 6223; 25 guineas, to Mr. R. Outhwaite.

BLUE BONNET, red and white, calved December 28th, 1848, got by Jeweller, 10354; 35 guineas, to Mr. Lawson.

SUNSET, red and white, calved January 20th, 1849, got by Vanguard, 10994; 21 guineas, to Mr. Aylmer.

CONCEIT, roan, calved March 20th, 1848, got by Exquisite, 8048; 37 guineas, to Mr. Lambert.

VENUS VICTRIX, roan, calved August 25th, 1849, got by Vanguard, 10994; 175 guineas, to Mr. R. Booth, for Mr. Chaloner.

PRESENT, white, calved February 1st, 1850, got by Augustine, 9913; 26 guineas, to Mr. Lambert.

SPICEY, red and white, calved February 22nd, 1850, got by Exquisite, 8048; 33 guineas, to Mr. Knox.

SYLPH, red and white, calved April 1st, 1850, got by Royal Buck, 10750; 47 guineas, to Mr. Lambert.

PEARLY, roan, calved August 26th, 1850, got by Royal Buck, 10750; 105 guineas, to Mr. Townley.

GERM, white, calved January 25th, 1851, got by Harbinger, 10297; 70 guineas, to Mr. Fetherstonhaugh.

DAMASK, red and white, calved in 1850, got by The Dandy, 10926; 21 guineas, to Mr. Duncombe.

WIDE-AWAKE, red and white, calved August 14th, 1850, got by Royal Buck, 10750; 10 guineas, to Mr. R. Emmerson.

FAREWELL, red and white, calved June 12th, 1851, got by Royal Buck, 10750; 21 guineas, to Mr. R. Emmerson.

OFFICIOUS, red, calved March 26th, 1852, got by Hopewell, 10332; 16 guineas, to Mr. Douglas.

CYCLOID, red and white, calved January 15th, 1852, got by Hopewell, 10332; 40 guineas, to Mr. Torr.

EQUITY, red and white, calved March 17th, 1852, got by Lord George, 10439; 26 guineas, to Mr. Townley.

HEIRLOOM, roan, calved December 13th, 1851, got by Crown Prince; 85 guineas, to Mr. Ambler.

ECSTACY, white, calved August 21st, 1851, got by Hopewell, 10332; 82 guineas, to Mr. Douglas.

BULLS.

HAMLET, 8126, roan, calved October 15th, 1844, got by Leonard, 4210; 66 guineas, to Mr. Bate.

LORD GEORGE, 10438, white, calved June 2nd, 1846; 40 guineas, to Mr. Gulland.

RED KNIGHT, red, calved July 28th, 1850, got by Royal Buck, 10750; 110 guineas, to Mr. Hay.

NEPTUNE, roan, calved November 14th, 1850, got by Water King, 11024; 86 guineas, to Captain Dilke.

HOPEFUL, roan, calved December 22nd, 1851, got by Hopewell, 10332; 41 guineas, to Mr. Tim.

TWILIGHT, roan, calved December 29th, 1851, got by Lord George, 10439; 11 guineas, to Mr. R. Emmerson.

GEORGE, white, calved November 19th, 1851, got by Lord George, 10439; 21 guineas, to Mr. Spraggon.

KILLERBY, white, calved April 25th, 1852, got by Hopewell, 10332; 62 guineas, to Mr. Knox.

EXAMPLE, white, calved July 2nd, 1852, got by Crown Prince; 35 guineas, to Mr. Lambert.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

BARNSTAPLE FAIR.—Almost every head of bullock was sold at unusually high prices, even to 20 per cent. advance; and, in relation to prices this time two months, the advance is full 50 per cent. Ewes of the horned or Exmoor breed were sold for 24s. a head—double the sum they fetched twelve months since. They are a small race of sheep, weighing, when fatted, about 13lbs. the quarter. They were bought for breeding, the mutton being a favourite as well for the flavour as for its small size. Notted sheep of the Devon breed, being a mixture of the Leicester and the horned species, also sold well, the ewes for lambing fetching 35s. each; these sheep fattened would weigh about 20lbs. per qr. The horses sold have fetched good prices, but there were only few horses approaching to first rate quality.

BASINGSTOKE FAIR.—The number of sheep penned was less than on former years, and the farmers persisting in an advance on some of the late fairs, which buyers were indisposed to submit to, very little business was done. The show of other cattle was but indifferent.

BEDALE FORTNIGHT FAIR.—We had a thin supply of fat cattle, of moderate quality, and an average number of fat sheep: all were cleared away at the prices obtained last market. Lean stock was in request. A large number of half-bred lambs were offered, and sold at from 12s. to 15s. each. Beef, 5s. 3d. to 6s. per stone—mutton, 5½d. to 6½d. per lb.

BEAMINSTER FAIR, notwithstanding the unfavourable state of the weather, was numerously attended, and an average amount of business transacted. The number of sheep penned was about 1,500, most of which exchanged hands at the following quotations; namely, horn ewes from 34s. to 42s., Southdowns from 26s. to 35s., lambs from 15s. to 24s. Fat beef sold at 8s., barreners 5s. per score; cows and calves from £8 to £12. A considerable quantity of cheese was pitched, and found purchasers: raw milk at £2 10s. to £2 16s., and skim from £1 2s. to £1 10s. Pigs generally fetched low prices.

CARLISLE FAIR.—The day was wet and cold, but the attendance of business-men was numerous and important. The supply of cattle was short—so short of promising stock that many persons who intended to purchase largely were disappointed; prices, as a consequence, ruled high, the advance on the best qualities averaging from ten to twelve per cent. Sheep and lambs were equally in request, and advanced above the high

prices obtained at recent fairs; the former from 2s. 6d. to 3s. 6d. a head; the latter, 1s. to 1s. 6d., and in some instances 2s. a head. One person of whom we inquired the course of business said—"Ay, sheep were sheep, and as to lambs I dared not purchase, for I don't expect that profit can be made out of them." In the horse-fair in Lowther-street, there was the usual large show of hard working farm-horses at this season, most of whom might have been bought on very reasonable terms, but, truth to tell, the majority were worth little. Of good cobs, handsome roadsters, hunters, and carriage horses there were few indeed; we may say, none. These are all picked up by the dealers before they come openly to market. Nothing very good can be obtained for less than from £40 to £45; ordinaries, £30 to £35. There were no real Shetland ponies: only a few cross-breeds of no likelihood. Taken as a whole, the fair was a brisk one—and even the pigs exposed in Lowther-street partook of the upward movement. It is a bad grunter indeed for which the seller does not now ask from 16s. to 20s each.

CREDITON FAIR.—There was but a small supply: poor stock sold freely, particularly steers; a moderate supply of beef, which sold at 8s. 9d. to 9s. per score. Of stock sheep there was also but a moderate supply, which found ready purchasers.

COPPERHOUSE FAIR was well attended. Fat bullocks sold at from 46s. to 47s, per cwt., and other cattle at about the average prices.

DRIFFIELD FAIR.—The harvest being nearly brought to a close, the attendance of farmers and others was very numerous. The supply of horned cattle was small, and principally grazing stock. There was a very large supply of sheep and lambs, which were readily bought up. Lambs averaged from 22s. to 31s. 6d. per head, and holding ewes from 26s. to 30s. per head.

DUNDEE FAIR.—Owing to the high prices obtained at the Falkirk Trysts, the condition of wintering food, and the propitious state of the weather, a more than usual attendance of dealers was induced. The show of wintering stock was vastly superior, both in point of quality and numbers, to the displays at the two former markets; and from the large attendance of purchasers prices consequently ranged high. For fat cattle 6s. to 7s. a stone was asked, and for secondary beasts 5s. to 6s. a stone; for two-year-old stots, £7 to £10; three-year-olds, £9 to £12; milk cows, from £7 to £12 10s.; and for calvers, £12 5s. to £15. Owing to the severity of last winter, but mostly to the great purchases by Irish farmers, there were no sheep at the market, and the few lambs exposed, which were not of first-rate quality, were sold at from 4s. 6d. to 6s. 6d. each. The show of horses was much superior to those produced at the "first" fair, and the supply was much greater than the demand. Good draught horses brought from £30 to £35; two-year-old colts from £20 to £25; and ponies, £8, £10, £12, and £15. Purchases were cautiously and stiffly made until an advanced hour in the afternoon, when bargains were closed more readily at the prices previously obtained, and by 5 o'clock there were very few cattle for sale. A number of horses, both good and inferior, however, left the field without changing hands.

DUNSE EWE AND LAMB TRYST.—There was but a small supply both of ewes and lambs, which were all soon and easily disposed of at high prices. Ewes realized from 4s. to 6s. above last year's prices; bred ewes sold from 36s. to 40s., and half-bred do. from 30s. 6d. to 34s. There was only one lot of bred lambs shown, and sold for 21s. Half-bred lambs brought from 15s. to 19s., and Cheviot do. from 10s. to 15s. There were few cattle, and prices much the same as recent markets.

EVESHAM FAIR was but moderately supplied with fat cattle. Store were very plentiful, and more equal to the demand. Of sheep the supply was good, and prime qualities realized 6d. per lb. There were many good rams, but the sale was flat, and price low. Agricultural horses were plentiful; nags were in demand. Altogether trade was dull.

GLASTONBURY FAIR was very numerously attended by dealers and others. Good beef sold readily at from 9s. to 9s. 6d. per score. Good wether sheep fetched 6d.; ewes, 5d. to 5½d. per lb. There was a great many horses offered, but very few good ones, and a large number of colts, which sold well.

GLOUCESTER MARKET was tolerably well supplied and attended, and with the exception of the business done in the transfer of stock, an excellent demand was experienced, and good prices were obtained. The show of cattle was extensive but of inferior quality; prices had a downward tendency, and a great number remained unsold. Wether sheep (of which there were but few penned) sold at 6d. per lb.; ewes, from 5d. to 5½d. Of cheese there were nearly 200 tons, the principal part of which found buyers at the following prices:—Best doubles from 48s. to 54s.; singles, 42s. to 46s.; seconds, 36s. to 40s.; skim, 21s. to 28s. per cwt. Of wool there were only about 150 tods, owing no doubt, in a great measure, to the unfavourable weather. The whole of it was sold at from 28s. to 31s. per tod.

KENDAL FORTNIGHTLY FAIR.—Sheep were numerous and in fair request at late enhanced prices. Cross breeds in general obtained from 26s. to 30s. per head; blackfaced ones from 20s. to 24s. each; small fell Sheep from 17s. to 19s. Lambs of all breeds varied in price from 17s. to 21s.; Lambs for feeding of from 13s. to 14s. 6d. Sheep, out of condition, and which were chiefly purchased by farmers, were readily disposed of at from 19s. to 21s. 6d. Calves were also plentiful and met with a ready sale at from 1*l*. 12s. to 3*l*. 3s. Cows were selling at—for the best description at from 10*l*. to 12*l*. 10s.; aged and inferior ones at from 8*l*. to 9*l*. Heifers were numerous, but generally of a small size and not by any means in prime condition. Prices for such kind of stock ranged from 8*l*. to 11*l*. 10s. Lean cattle, milk cows of which there were several at market, were being disposed of at from 9*l*. to 12*l*. The above prices were the general rates paid, but there were a few superior animals that obtained higher figures.

LEWES GREAT SHEEP FAIR.—There were penned about 25,000 sheep and lambs. The attendance of purchasers was unusually large, and the fair opened with a brisk demand, which continued up to dinner-hour, at which time quite two-thirds of the sheep had changed hands at the following prices: Ewes, from 26s. to 37s.; ewe tegs, from 26s. to 32s.; wether lambs, from 19s. to 29s. 6d.; wethers, from 30s. to 35s. Among those sold were—Ewes: A very fine lot belonging to Mr. Denman, of Stoneham, for 37s.; the second lot at 30s. Mr. Emery, of Hurston, who lost 20 of his ewes from the Lewes Paddock the night before, sold his at 42s.; Mr. Gorringe, of Kingston, at 37s.; Mr. Woodman, of Glyndbourne, at 35s.; Mr. Hart, of Beddingham, at 36s.; Mr. Penfold, of Harringtons, at 34s.; Mr. George Blaker, of Pangdean, at 31s. 6d.; Colonel Paine, at 36s.; Mr. Steyning Beard, at 28s.; Mr. Hudson, at 31s. 6d.; Mr. Gausden (broken-mouthed), at 22s. 6d.; Mr. Cowley, of Preston, at 36s.; Mr. Clew, at 30s.; Mr. Catt, of Itford, at 26s. 6d.; Mr. Hudson, at 27s. 6d.; Mr. Turner, of Chinton, at 32s.; Mr. Willard, of Newhaven, at 31s.; Mr. Ellis, of Exceat, at 31s. 6d.; second lot, 28s.; Mr. Wood, of Plumpton, at 28s.; Mr. Elphick, of Newhaven, at 35s.; Mr. Pennington, at 28s.; Mr. Madgwick, at 30s.; Mr. Scrace, of Friston, at 34s.; Mr. Child, of Michelham, at 33s.; Mr. Stunt, of Southerham, at 33s. Wether Lambs: Mr. Turner, of Ditchling, at 29s. 6d.; seconds, 25s.; Mr. Waters, at 28s.; Mr. J. Gorringe, at 26s.; Mr. Catt, Westfirle, seconds, at 19s.; Mr. P. Beard, at 27s.; Mr. Waterman, of Piddinghoe, at 24s.; Mr. Lane, at 27s.; Mr. Farncombe, at 24s.; Mr. Lambe, at 25s.; Mr. Tanner, at 27s. 6d.; Mr. Hide, of Chiddingly, at 19s. 6d.; Mr. Child, of Michelham, at 24s.; Mr. Stunt, at 25s.; Mr. Tompsett, of Deans, at 21s. 6d.; Mr. Tompsett, of Balmer, at 19s.; also Mr. Pennington, at 22s.; Mr. Elphick, at 24s.; Mr. Catt, at 25s.; second, 21s.; Mr. Alfree, at 24s. Wethers: Mr. Wood, of Hickstead, at 31s., which were re-sold immediately afterwards at 32s.; Mr. Waters, of Cooksbridge, at 32s.; Mr. Hillman, of Barcombe, at 35s. Ewe Tegs: Mr. Scrase, of Ditchling, at 30s., mixed. There were some very good rams for sale in the fair, which attracted considerable attention. Among these we noticed those from the flocks of the Earl of Chichester, Mr. John Saxby, Mr. Boys, Mr. Thomas Ellman, &c.; but the flockmaster who made the greatest display was Mr. Hampton, of Applesham. He brought into the fair the surprising number of 52 rams and ram lambs, of which he sold 50, realizing for rams from £7 to £15 15s., and for ram lambs from £3 to £5 each. Before four o'clock in the afternoon, the pens were generally cleared at the prices we have mentioned. Very many purchasers who arrived at noon were compelled to leave without being able to secure to themselves a single lot. In fact, take the fair altogether, it was the best that has been held for 25 years, arising from

the extraordinary character of the present year, which in spring placed the flockmasters in the greatest possible straits for feed, and in autumn furnishes an extraordinary abundance of aftermath and root food. To meet this demand there is not sufficient supply, and hence the advance in prices.—*Sussex Express.*

MINNYHIVE FAIR.—Betwixt two and three thousand draft ewes and lambs were shown. The demand was excellent, and the lots speedily changed owners. Lambs brought about 1s. 6d. per head more than at the August fair; and ewes about 3s. 6d. higher than the prices current at the same market in 1851.

MOFFAT ANNUAL TUP MARKET.—The show in point of numbers was considerably above an average, there being about 300 sheep more than there were last year, the number this year being about 1,300, whereas last year it was somewhat short of 1,000. The buyers were numerous from all parts, composed of the Highlanders that attended the Falkirk tryst, Englishmen from the various breeding counties, and the farmers in the neighbouring districts. The principal part of the stock was composed of Cheviots, and a few of the Leicester breed. The demand appeared to be principally for the Cheviot sheep; but the Leicesters being fewer in number, met with a ready sale. Very little business was done in the early part of the morning; but shortly after the arrival of the trains from Carlisle and Edinburgh about eleven o'clock (which trains brought the bulk of the purchasers), a good deal of business was done. The weather being very favourable for the market, and the season being all that could be desired for pasture, the stock was in very excellent condition; in short, such a show in point of numbers and quality was never seen at Moffat. There is no doubt, had it not been for the extra numbers shown here to-day, stock of all kinds would have advanced very considerably, as every intending purchaser before coming to the market had, it appeared, made up his mind for a considerable advance, but the extra stock shown had the effect of checking the anticipated great rise to a certain extent. The large price got of late years for sheep, more particularly at the auction sales in the south of Scotland, had, it appears set all store farmers on edge, and had all but glutted the market upon this occasion. For really good Cheviots, an advance of from 5s., 10s., to 15s., and even up to 1*l.* a head was got, according to quality, in the morning, above the prices of last year. Regarding the Leicesters, we can only say that a shade higher was got for this kind above last year, and although not up to the auction sales in the district for this season, a total clearance was effected. Ireland, as at all markets of late, has stood foremost in the field, and upon this occasion has purchased largely amongst the Leicester stock. The Leicester sheep, it was allowed, brought from 3*l.* 10s. to 5*l.*, and so high as 6*l.* was obtained. The Cheviots effected all but a clearance, the only thing being left was a few of the higher priced kinds of sheep, and a few of the inferior qualities—the former of which might probably be disposed of before leaving the stance, but the latter were only fit for the Liverpool butchers. All good serviceable sheep met a good sale. Although there were no ewes on the market stance, we believe several hundreds were disposed of at the last Falkirk tryst rates.—*Dundee Courier.*

NANCLEDREA FAIR was well supplied with various kinds of cattle. The umpires, Mr. Richard Berryman, St. Erth; Mr. John Michell, Zennor; and Mr. Josiah Glasson, Chyponds, Towednack, awarded the successful competitors as follows:—Best mare and colt for general purposes, Mr. James H. Sandow, Lelant; best saddle mare from two to three years old, Mr. Robert Curnow, Towednack; best cart horse, Mr. Martin Trewhella, Lelant; best colt from one to two years old, Mr. Matthew Trewhella, Brunion; best colt from two to three years old, Mr. William Quick, Lelant; best fat bullock, Mr. Thomas Michell, Lelant; best milch cow, Mr. William Eddy, Lelant; best two years old heifer, ditto; best bull, Mr. William Richards, Penzance.

NORTHAMPTON CHEESE FAIR.—The quantity of cheese pitched this year was very small—the smallest we remember to have seen. There was about a couple of tons from dairies in our own neighbourhood, which sold, the skim milk at from 28s. to 32s., and the two meal at 40s. The Leicestershire factors brought about four tons, which fetched from 56s. to 60s. Part only was sold. Sheep and cattle—sheep especially—more than counterbalance the deficiency of the cheese. The Market-square, on Monday last, was covered with store sheep, both shearhogs and ewes, which fetched high prices, and were all sold. Mutton was in short supply, and all was sold from 3s. 6d. to 4s. per st. Store beasts were an indifferent show, and were mostly sold at prices of which the graziers complained as being very high. There was about the usual supply of beef, which sold at from 3s. 4d. to 3s. 8d. per stone, choice things making 3s. 10d. and over. There were some excellent rams, and Messrs. Lyne and Cother, of Middle Aston, sold 38 and let 2, at an average of nearly 9*l.*, although Mr. Cother stated that he had previously sold 69 this season, 100 of the whole being shearlings, such was the substantial character of the flock, and so high the reputation of these gentlemen among our breeders.

PENRITH FORTNIGHT FAT FAIR.—Very few sheep and cattle were shown, in consequence of there being a sheep fair at Pooley Bridge on the same day. Few sales were effected, the prices being about the same as those at the last fair.

POOLEY BRIDGE SHEEP FAIR.—The exhibition of all kinds of sheep was a very scanty one. Selling was brisk, and altogether the fair was a capital good one, three shillings a head being the general quotation above the prices at this fair last year.

TOWEDNACK FAIR was well supplied with fat cattle, which met with a ready sale. There were also some fine horses, yet only a few exchanged hands.

WOODBURY HILL SHEEP FAIR was well supplied with sheep, which met with a ready sale at prices full equal to those realized at recent fairs. A capital lot of one hundred ewes belonging to J. J. Farquharson, Esq., were sold by auction, and fetched from 34s. to 70s. In the horse fair there was a poor supply of hacks; but of cart colts many were offered, and several changed hands at high prices.—*Dorset Paper.*

WORCESTER FAIR.—The attendance of buyers and dealers was very numerous, and the railway trains, special and otherwise, were well patronized. The hop merchants from a distance generally renewed their complaint that the fair is held at least a fortnight earlier than is warranted by the quantity of hops which the district for years past has been enabled to prepare for the market. Of new pockets weighed this day there were 243 only, which sold at prices ranging from 80s. to 90s. per cwt. The cheese fair, held in the Corn Exchange, Angel-street, was singularly deficient of best descriptions, while the small supply of skims realized from 20s. to 24s. per cwt. The number of sheep penned in the cattle-market amounted to nearly 6,000, being an increase of about 1,000 over last year, though the greatest number ever here exhibited for sale reached 7,000, in 1847. Cattle not so numerous as on former occasions, while of horses and store pigs there was an exceedingly fair show; the latter fetched good prices. Beef, 6d. to 6½d. per lb.; mutton at the same figure. The sale of a number of fine Leicester ewes, by Messrs. Hobbs and Son, realized fair prices. Some cross-bred rams, belonging to Mr. Walker, of Blackmore Park, were sold by Mr. Higgs, at prices averaging £7 each, and a remarkably fine one was knocked down for £17. Mr. Bentley disposed of eighty-one shearhog Cotswold rams, averaging £6 10s. each, bred by Mr. William Hewer, of Northleach. Mr. Saunders sold some waggon and hack horses, which also realized good prices. Mr. Arkell obtained an average of £7 10s. each on the sale of some very fine Cotswold rams, belonging to Mr. Fletcher; and there were several other sales of cattle, &c., on the ground.

YORK FORTNIGHT MARKET.—We had a good supply of fat beasts, which caused prices to recede a little from last market. Prime-fed, choice beasts, 5s. 6d.; inferior ditto had dull sale at 5s. per stone and under, with many unsold. Mutton sheep were in good supply, and prices lower: ewes, 5d.—wethers, gimmers, and lambs, light weights, 6d. per lb. Calving and dairy cows were in good supply and demand, at steady prices. A quantity of lean beasts had good sale, and rates high compared with those obtained for fat beasts, thus leaving a dreary prospect for grazing; many unsold. Grazing lambs and ewes for tupping:—This was the first of three markets for this kind of grazing stock, and which becomes more important every year. To-day we had an immense supply of South Down, Yorkshire, Wold, Balmshire, Cheviot, Tees Water, Scotch and Border, Masham, and Moor-bred ewes and lambs: all these had good sale, at prices seemingly impossible to pay for grazing. A few only were unsold.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF SEPTEMBER.

One of the most tedious and expensive harvests we have had for some years has at length been brought to a conclusion; the result is what might be expected under the circumstances—great variety in the quality of the new grain, and a very unsatisfactory return in a pecuniary point of view, as far as the farmers of the south are concerned. The loss from the inferiority of the quality alone must prove immense, and we fear that the season will be most disastrous to the British agriculturists. The yield to the acre may perhaps not prove so bad as was at one time feared, but as a large proportion of the wheat is not worth more than 28s. to 30s. per qr., and some even less, it may easily be conceived that even with a full average in quantity the grower will not be remunerated by his crop for his outlay.

The mischief done by the very inauspicious weather experienced from the commencement of August up to the 20th, during which period we had only three dry days, was far more serious in the southern than in the northern parts of the kingdom. To the north of the river Humber the grain was not then so far advanced, nor was the weather so thoroughly wet, as with us; and it is certain that the principal wheat and barley-producing counties have this year suffered most extensively. We think that as regards quantity the aggregate yield of wheat of the United Kingdom will probably turn out equal to that of average years; but in quality the deficiency will be very great. During the last months new wheat has come forward pretty freely in all the markets of the south, and a fair opportunity has therefore been afforded of judging. The bulk of straw is acknowledged to be immense; and notwithstanding the prevalence of small shrivelled grains, in consequence of premature ripeness, blight, mildew, and last, though not least, the damp condition in which most of the wheat was carried, there are comparatively few complaints of the yield to the acre. The great source of regret is the defective quality and light weight: few samples are entirely free from sprout, the condition is very generally soft, and the weight per bushel 4 to 5lbs. lighter on the average than last year. These remarks may be considered as applying to nearly the whole of the wheat crop grown south of the Humber, certainly the most important section of the kingdom. As we proceed northward we find the quality improve; and in Yorkshire and further north there will, we are inclined to think, be no deficiency. Barley, the next crop in importance to wheat, has suffered to nearly the same extent; and it is to be feared that really fine malting samples will be universally scarce this season. The very hot weather in July was not favourable for this grain, and the subsequent excess of wet caused sprout and discoloration; a very large proportion of the new barley will therefore be unfit for malting purposes. The yield we are disposed to estimate at about an average. Oats are not so extensively grown in England as they used to be formerly: the quality has been more or less injured by the wet weather in August; still, according to the acreable breadth sown, the return will we think turn out tolerably well. A considerable proportion of the winter-planted beans was destroyed by blight, and those sown in spring suffered in the first instance from drought, and subsequently from wet; the yield is therefore short, and the quality various. Peas are a deficient crop, but a part was secured early, of satisfactory quality.

From the above remarks it will be observed that we do not consider ourselves justified in estimating the produce of any description of grain or pulse at more than an average in quantity; and the quality of each will, we apprehend, be found inferior to the growth of moderately good seasons.

We have now to draw attention to the potato crop, and we regret to say that this important article of food has suffered quite as extensively from the generally unfavourable character of the season as have the corn crops. The disease attacked this root earlier than usual, and we began to hear complaints as early as July; to these, however, little attention was then paid, for up to that period the grain fields presented so promising an appearance, that a partial loss of the potato was not considered of sufficient importance to produce much influence. Since then it has, however, become a matter of the utmost importance, and the subject has, therefore, received strict attention. The result of the investigation has been the conviction that the disease is more general and virulent than it has been in any preceding season for several years past; and many parties, who are well qualified to decide on the point, are of opinion that the loss will be as great, if not greater than in the disastrous year 1846. It is tolerably plain, therefore, that there will be a considerable deficiency in the total quantity of food raised in the United Kingdom, and that unless we have a much higher range

of prices than we have yet had since the commencement of free-trade our farmers must be in a worse position than at any previous period. The probable future range of prices has consequently become a matter of the highest importance. A month ago there was every appearance of the value of wheat rising materially, and in the month of August an advance of 5s. to 6s. per qr. was realized. This was caused by the *fears* entertained that the wet weather then experienced would produce extensive mischief. These *fears* have been more than realized; of this we have undoubted proof in the samples of the new produce; notwithstanding which the trade has languished, and a part of the rise has been lost. How is this to be accounted for? The answer is obvious: whilst the harvest has turned out so unsatisfactory in this country, the north of Europe has been favoured with good crops. America has an abundant harvest, and in Southern Russia there will be a large surplus of wheat over what the home demand will require, for export. The whole of this surplus can at any period be poured into the British markets; foreign growers may, and probably will, wait for some advance before they consign largely; but the knowledge that we may be overwhelmed with foreign supplies prevents our merchants and millers acting with confidence, keeps farmers in constant apprehension and prevents them receiving anything like a remunerative return for their outlay of capital and industry.

That very large importations of grain will be needed cannot be questioned; and this being tolerably well understood abroad, holders on the other side may perhaps not be in any hurry to forward supplies, and, on the whole, we are rather inclined to expect a moderate improvement on present rates. The imports lately have not been very large, and, as compared with those of the corresponding period last year, a material falling off is shown. During the seven months ending 5th August, the importations into the United Kingdom have been, in—

	1852.	1851.
Wheat.....	1,327,790 qrs.	2,683,177 qrs.
Barley	364,396 „	611,679 „
Oats	540,012 „	774,301 „
Beans	249,487 „	181,770 „
Peas	42,818 „	58,488 „
Indian Corn..	708,864 „	1,081,597 „
Flour.....	2,417,453 cwt.	3,171,833 cwt.
Total, including Flour as Grain	3,930,631 qrs.	6,323,004 qrs.

Business at Mark Lane has been quiet throughout the month, and the fluctuations in prices have not been of much importance.

The arrivals of wheat coastwise have been moderate, and the quantity brought forward week by week from the home counties less than is usually the case immediately after harvest. This may, however, be readily accounted for—the new wheat having been so badly harvested as to render farmers unwilling to thrash freely until it shall have been in stack a sufficient time to allow it to harden and improve in condition. Nearly the whole of the supply has, however, consisted of new, from which it might be argued that stocks of old are running short; but this we are not prepared to coincide with.

At the close of August the commoner runs of new Essex and Kent red wheat, weighing 56 to 57 lbs., were worth 32s. to 33s. per qr.; the finer kinds, 35s. to 37s.; superior, 38s. to 40s. These rates have been tolerably well supported, though the demand has not at any period been active. It would be tedious and unprofitable to describe the transactions which have taken place on particular occasions, as scarcely any alteration has occurred either in demand or value. The best picked lots have been taken off readily by the millers, but factors have been unable to obtain any improvement. The ordinary kinds have been bought principally by the starch-makers, at 30s. to 32s. per qr. Most of the white wheat, which has come forward in tolerably dry condition, the weight being rather below 61 lbs. per bushel, has sold at 42s. per qr. Within the last eight or ten days the disposition to purchase has slightly increased, and in partial cases an advance of 1s. per qr. has been realized for the best-conditioned samples.

As yet, comparatively little wheat has reached us from Lincolnshire, Cambridgeshire, and that neighbourhood; that which has come forward has, for the most part, been of very ordinary quality, and all the reports agree in stating that the injury sustained by the wheat crop, on the fen lands along the east coast, has been very extensive. Prices range very wide in the markets in that quarter, say from 25s. to 44s. per qr., according to quality.

The arrivals of foreign wheat into London have not been particularly large; they have, nevertheless, more than sufficed for the demand, the country enquiry having been far from active, which leads us to conclude that fair supplies of old English wheat are being brought forward; for it is certain that the new cannot be manufactured by itself. We are, however, inclined to expect an increased demand for foreign later in the season, and believe that London will have to provide a wide circuit of country, between this and Christmas, with old wheat. The town millers bought freely during the excitement in August, and have since manifested no disposition to make further addition to their stocks; besides what they bought on the spot, they were induced to send out orders to the Baltic for the

purchase of wheat, and at present about 30,000 quarters are in progress of shipment from Danzig, Rostock, &c., on account of London millers. The prospect of this supply coming forward shortly, naturally influences their operations, and having had no speculative buyers, business has throughout the month been quiet. Importers have, nevertheless, remained firm, and where it has been found impossible to sell from on board, except by giving way in price, landing expenses have been incurred rather than the other alternative. The stocks in granary have consequently increased more or less, but holders appear to reckon confidently on a more free sale later in the year. Polish Odessa, which in August rose to 40s. per qr., has since receded to 38s., and good red Lower Baltic wheat might be bought at present at 44s. to 46s. per qr. Danzig is held at from 44s. to 50s. per qr., which is about the same as the prices demanded at the close of last month. The operations in floating cargoes have not been so important as in the month of August, but for the greater portion of what has arrived off the coast from the Mediterranean and Black Sea, having been sold previous to coming forward, there has been little or no pressure. In one or two instances Polish Odessa has, we believe, been sold at 35s. per qr., cost and freight; but, at present, 36s. per qr. is asked. The finer kinds of Black Sea wheat have commanded relatively higher rates. A few cargoes of Egyptian on passage have lately changed hands at 30s. to 32s. per qr., cost, freight, and insurance, which is quite as much as the same would have brought a month ago. We have had offers of fine red wheat from the Lower Baltic ports at 42s. to 42s. 6d. per qr., cost and freight. These rates buyers have, in general, refused to give, and the free-on-board transactions have consequently not been important; at 40s. to 41s. per qr. purchasers might, we think, have been found, which, considering that the premiums for insurance are now rising rapidly, would not allow much margin for profit on present prices here.

The nominal top quotation for town-made flour has not varied; the sale for the article has throughout the month been rather tardy—the large quantity of American which has been offered having interfered with the disposal of that of home-manufacture. Town household flour has been selling the last week or two at 35s., and Norfolk over the ship's side at 30s. per sack. The arrivals from America have been rather liberal, and the reaction in prices from the highest point has been 1s. to 2s. per brl. Tolerably good brands may now be had at 21s. to 22s., and fine at 23s. per brl.: there are, however, some fancy brands which are still held at 24s. to 25s. per brl. The receipts of French flour have been moderate; American has interfered with the sale to a considerable extent, and the best Marseilles has moved off slowly at 34s. per sack.

The quantity of English barley of the new crop hitherto brought forward—of old, supplies have long ago ceased—the finer kinds suitable for malting have been in lively request, and have commanded full terms; moderately good runs 30s. to 32s., and really fine 33s. to 34s. per qr. A large proportion of the supply has, however, been of too inferior quality for malting: such has moved off slowly at relatively low prices. The receipts of barley from abroad have been smaller than expected; and the demand for feeding sorts having been tolerably active, prices have, within the last week or two, rather tended upwards. Unless the supplies from abroad increase maternally, this article is likely to improve in value, as the stocks on the spot have been reduced into a narrow circle. The lighter sorts, such as we usually receive from France, may be quoted 24s. to 24s. 6d., and good heavy Danish cannot be purchased below 25s. to 26s. per qr. Most of the Egyptian barley has been cleared off the market. Considerable sales were made in the early part of the month at 18s. per qr., from on board ship. Since then the price has crept up fully 1s. per qr., with more buyers than sellers at the advance. For cargoes on passage nearly as much money is asked as for parcels on the spot; the bargains closed have, consequently, not been very numerous, though there has been an evident disposition to buy. The new barley will not, it is expected, make such fine malt as that of last year's growth; and the stocks of old malt having become reduced, holders of the latter have demanded full prices for good ship samples, 56s. to 58s., and for fine Ware 60s. per qr., and even more, having been asked.

The receipts of English oats at this port have consisted of a few small lots of new scarcely worth naming. From Scotland we have received no supplies of the new crop as yet, and the arrivals of old have been moderate. The entire supply from Ireland has also been small, and we have had to depend principally on the arrivals from abroad. These have, however, been on a sufficiently liberal scale to compensate for the trifling character of the home supplies. By far the greater proportion of the foreign oats have been from the port of Archangel. The prevailing opinion is, that the quantity now on passage from there is small and as there is no probability of any immediate increase in the receipts from other quarters, some improvement in prices is naturally calculated on. The fluctuations in the value of this grain have not been important since our last: the turn has, on the whole, been in favour of the buyer; but the only kind on which any quotable concession has been made has been the Arch-

arrels. At the close of August these were worth 17s. 6d. to 18s. per qr., soon afterwards they fell to 17s. 3d. to 17s. 6d., and latterly 17s. has, in some cases, been accepted. Within the last week, however, buyers have offered that price freely, but sellers have declined to take less than 17s. 3d. per qr. When what still remains on board ship shall have passed into the hands of the large dealers, they will, in all probability, demand advanced rates, and we are inclined to think that the lowest point has been passed for good old corn.

Beans have come to hand very sparingly; stocks of old seem to be nearly exhausted, and farmers appear to be in no hurry to send new to market. The supply having hardly sufficed for the consumptive demand, prices have gradually improved, and quotations are at present 2s. to 3s. per qr. higher than they were at the close of last month. Egpytian beans have participated in the advance, and good qualities in granary cannot be purchased below 28s. per qr. The arrivals from Alexandria have been small, and we do not hear of many cargoes being close at hand. There are buyers at present of cargoes on passage at 25s. per qr., cost, freight, and insurance.

Very few English peas have appeared at market, and, according to the accounts thus far received, this crop has proved exceedingly short. White boilers have lately commanded 40s. per qr.—being a rise of 5s. per qr. on the rates current when we last addressed our readers. Other sorts have risen in the same proportion. Foreign white peas have been in active request for stores: large quantities having been taken as provisions for emigrant ships. Fine maple peas would probably bring 35s. to 37s. per qr.

In proportion as the spread of the potato disease has progressed, so have the holders of Indian corn raised their pretensions. There has, however, been less disposition to speculate in this article than might, under the circumstances, have been expected. The purchases made have been almost entirely on Irish account, where the consumption is now increasing rapidly.

The most recent sales of Galatz and Odessa Indian corn have been at 28s. 9d. to 29s. 3d. per qr., cost, freight, and insurance. Other sorts have brought corresponding terms, and, at present, there are few cargoes arrived off the coast or close at hand undisposed of. Stocks in Ireland are much reduced, and, as potatoes rise in value, the demand for Indian corn must increase.

The expectations of a good wheat harvest in most of the northern continental countries appear to have been fully realized. There are, as is almost invariably the case, partial complaints from particular localities; but on the whole the accounts agree—with few exceptions—in speaking well of the yield and quality of the wheat crops over the greater part of Germany, Poland, Russia, &c. Rye seems also to have given a good return in northern Europe; and though the potato disease is said to prevail to rather a serious extent, and the crops of spring corn and pulse are deficient in many districts, still there will, no doubt, be a very considerable surplus of wheat, and fair quantities of barley and oats for exportation from the different Baltic ports.

We have seen samples of new wheat, the growth of Pomerania, Silesia, &c., of very superior quality, weighing 61lbs. to 62lbs. per bushel.

The advices from Danzig, Konigsberg, &c., also describe the quality of the new wheat as fine. Prices will, of course, be regulated abroad in a great measure by the extent of the English demand; if—as there is reason to suppose will be the case—we should require large supplies, foreign holders will take advantage of our necessities and insist on full terms. Hitherto quotations have been well supported abroad, notwithstanding the somewhat subdued tone of the British advices.

Letters from Danzig, dated 24th Sept., state that holders of fine high mixed wheat in granary had insisted on 45s. to 46s.; and some days previous a parcel of fine mixed, weighing 62lbs. to 63lbs. per bush., had been sold at 44s. per qr. The supplies from the neighbouring growers had not been large, and from Poland nothing was expected to arrive before the usual period. The purchases made during August were being shipped off, and, vessels having become rather scarce, freights were advancing.

The latest advices from Konigsberg state that purchases of wheat had been made there on Amsterdam account which had tended to counteract the effect which might perhaps otherwise have been produced by the continued dull accounts from hence. Old high-mixed wheat was quoted 41s., mixed 38s. 9d., and red 37s. 9d. per qr. free on board, the weight per bushel being 61½lbs. Freight to London was 3s. 6d., to Hull 3s. 3d., and Scotland 3s. per qr.

The reports from the lower ports do not vary much in character from the above; business appears to have been generally dull in consequence of the want of English orders, but this had failed to shake the confidence of holders, who had insisted on much the same terms as before, and good qualities could not be put free on board below 38s. to 39s. per qr.

The stocks of old wheat are reported to have become very much reduced, and supplies of new having come forward sparingly, there had been no pressure to sell. The probability is, therefore,

that after what is now on passage shall have reached us, the supplies from the Baltic ports will for a time be short. Wheat at 38s. to 39s., with rising freights and premiums for insurance, would not pay to consign to the English markets, unless prices advance here.

At the near continental ports wheat has excited little attention; and what has been done at Hamburgh has been principally on Dutch account. The last purchases were at 40s. 9d. to 41s. 6d. per qr. free on board, for 61 to 62lb. red Upland. At outports, good Holstein of 61lb. weight might have been bought at 38s. 6d., and kilndried Danish of 60lb. at 36s. per qr. free on board.

The comparatively high prices which have been paid for new malting barley at Mark-lane have caused those qualities best adapted to the purpose to be sought after, and at Hamburgh as much as 29s. 9d. per qr. free on board has been paid for 50lb. new Saale barley.

The news from Holland is not of particular interest. The wheat crop is well spoken of in the Rhenish Provinces, but in other quarters it is said to be deficient. In the early part of the month, purchases of wheat to some extent were made in the Rotterdam and Amsterdam markets for shipment to England, at prices considerably above those current here. These operations have now extended over a period of several months, and are said to have emanated from one party. The result of the consignments to London has been a loss on almost every transaction of 5s. to 6s. per qr.; and a good deal of surprise is, therefore, felt as to the object of these purchases. The latest accounts from Rotterdam state that the parties concerned had ceased to operate.

In France, the wheat crop seems to disappoint the growers; and though our accounts have certainly held out no inducement to buy, wheat and flour appear to have been in lively request there, at advancing rates.

From the Mediterranean we have nothing of much interest to communicate; and prices being relatively higher there than with us, we cannot expect supplies of much consequence from thence.

At the Black Sea ports, supplies from the growers were beginning to increase; and it was believed that, after a while, wheat would be procurable at somewhat easier rates. At Odessa, on the 8th September, Polish was obtainable at 26s., and Ghirka at 30s. per qr. Freight to London was 9s. per qr.

The American accounts continue to speak well of the result of the harvest; and there can be no doubt that the United States will be in a position to furnish abundant supplies of bread-stuffs, provided our prices are deemed sufficiently encouraging. The shipments, meanwhile, had not been very large, the exports to the United Kingdom, for the year ending 5th September, having been, in

	Flour.	Wheat.	Maize.
1852	1,444,640	2,713,120	1,576,749
1851	1,581,702	1,523,908	2,368,860

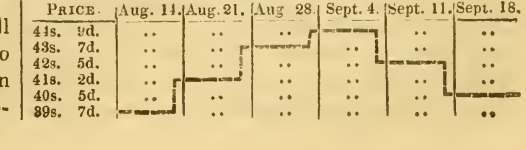
CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter.		
Wheat, Essex and Kent, white, new..	34 to 42	fine up to	46
Ditto ditto old ..	43 47	„	54
Ditto ditto red, new....	32 37	„	40
Ditto ditto old	40 44	„	48
Norfolk, Lincoln, & Yorksh., red..	42 44	„	45
Ditto ditto new	30 35	„	40
Ditto ditto white new, none		„	—
Ditto ditto old none		„	—
Barley, malting, new	29		31
Chevalier	32		33
Distilling	27		29
Grinding	26		28
Malt, Essex, Norfolk, and Suffolk, new	54 55	extra	58
Ditto ditto old	52 54	„	56
Kingston, Ware, and town made, new	58 59	„	60
Ditto ditto old	56 58	„	59
Oats, English feed	16 18	fine	20
Ditto Potato	19 21	extra	23
Scotch feed	20 22	fine	24
Ditto Potato	22 24	fine	25
Irish feed, white	16 18	fine	20
Ditto, black	15 17	fine	18
Rye	27 29	old 27	29
Beans, Mazagan	31 32	„ 30	31
Ticks	32 33	„ 32	33
Harrow	32 34	„ 33	34
Pigeon	36 40	„ 35	38
Peas, white boilers	38 40	„ 36	38
Maple	33 36	„ 33	36
Grey	31 33	„ 33	35
Flour, town made, per sack of 280 lbs.	— —	„ 38	43
Households, Town 35s. Country	— —	„ 33	35
Norfolk and Suffolk, ex-ship	— —	„ 29	30

FOREIGN GRAIN.

	Shillings per Quarter.					
Wheat, Dantzic, mixed..	42 to 43	high mixed	45	47	extra	53
Konigsberg	41 43	„	44	45	„	47
Rostock, new	41 42	fine old	43	45	„	47
Pomera., Meckbg., and Uckermk., red	39	40 extra	42			45
Silesian	„ 39	40 white	42			44
Danish and Holstein	„ 38	40 „	40			42
Barley, grinding			23			25
Distilling			25			27
Malting		none	—			—
Oats, Dutch, brew, and Polands			18			20
Feed			16			17
Danish and Swedish feed			17			19
Stralsund			18			20
Russian		17s.	17s.6d.			
French			16			18
Beans, Friesland and Holstein			28			32
Konigsberg			32			34
Egyptian			27			28
Peas, feeding	28	30 fine boilers	34			36
Indian Corn, white	27	29 yellow	27			30
Flour, French, per sack	28	32 fine	33			35
American, sour per barrel	19	21 sweet	21			23

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING SEPTEMBER 18, 1852.



IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Aug. 14, 1852..	39	7	27	5	19	6	30	3	33	7	31	4
Aug. 21, 1852..	41	2	27	4	19	3	29	4	33	2	29	10
Aug. 28, 1852..	43	7	28	2	20	3	29	9	34	4	31	1
Sept. 4, 1852..	44	9	28	2	20	5	31	3	34	10	31	6
Sept. 11, 1852..	42	5	27	10	18	10	30	9	34	5	31	9
Sept. 18, 1852..	40	5	27	4	18	7	30	1	34	4	29	10
Aggregate average of last six weeks	42	0	27	9	19	6	30	3	34	1	30	11
Comparative avge. same time last year	39	2	26	1	20	4	26	4	30	0	26	11
DUTIES.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1851.	Qrs.	Av. s.	d.
Wheat....	93,857 ..	40	5	Wheat....	106,252 ..	37	8
Barley....	7,897 ..	27	4	Barley....	8,070 ..	25	7
Oats	11,781 ..	18	7	Oats	12,598 ..	18	4
Rye.....	849 ..	30	1	Rye.....	417 ..	26	2
Beans....	1,975 ..	34	4	Beans....	2,236 ..	28	6
Peas	1,361 ..	29	10	Peas	1,027 ..	28	2

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.).. sowing 50s. to 55s.; crushing 45s. to 48s.
Linseed Cakes (per ton) ..... £8 0s. to £8 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £23
Ditto Cake (per ton) ..... £4 5s. to £4 10s.
Cloverseed (per cwt.) ..... (nominal.)
Mustard (per bushel) new, white 7s. to 10s., brown 7s. to 9s.
Coriander (per cwt.) ..... old 10s. to 12s.
Canary (per cwt.) ..... 38s. to 42s.
Tares, Winter, per bush, 5s. 6d. to 6s..... Spring (nominal)
Carraway (per cwt.) ..... new 46s. to 47s.; fine 48s.
Turnip, white (per bush.) ..... Swede (nominal).
Trefoil (per cwt.) ..... 21s. to 24s.
Cow Grass (per qr.) ..... (nominal) .. 00s. to 00s.

FOREIGN SEEDS, &c.

Clover, red (duty 5s. per cwt.) ..... (nominal.)
Ditto, white (duty 5s. per cwt.) ..... ,,
Linseed (per qr.).... Baltic, 43s. to 46s.; Odessa, 44s. to 47s.
Linseed Cake (per ton) ..... £7 to £9 10s. 0s.
Rape Cake (per ton)..... £4 5s. to £4 10s.
Hempseed, small, (per qr.) 40s. to 43s., Do. Dutch, 44s. to 46s.
Tares (per qr.) .... old, small 28s. to 30s., large 30s. to 32s.

HOP MARKET.

BOROUGH, MONDAY, September 27.

We have an increased demand for the better class of Hops, especially Sussex Pockets, which have undergone a slight improvement in value. Few Mid or East Kents have yet been disposed of.

Sussex pockets ..... 70*s.* *to* 76*s.*
Weald of Kent ditto ..... 80*s.* ,, 92*s.*
Mid. and East Kent ditto ..... *nominal.*

WORCESTER, (Saturday last.)—We have had a good supply of the new growth, which prove to be of very superior quality; 1000 pockets of which were sold at from 84s. to 95s. As yet we have not had any inferior samples at market, and should they not be to come, this will prove the best growth of hops we have had for many years, and do our planters great credit for improved management. Indeed we think some of our choice samples are equal to any other growth in the kingdom.

CHICORY.

Per ton.

	£	s.	£	s.		£	s.	£	s.
Foreign root (d p.)					*English root (free)*				
Harlingen	27	0	28	0	*York*	8	10	9	10
English root (free)					*Roasted & ground*				
Guernsey	10	0	10	10	*English*	30	0	40	0
Kent and Suffolk.	*none.*				*Forcign*	40	0	50	0

Duty on all Coffee and roasted Chicory imported, 3d. per lb.; on Chicory Root £21 per ton.

ENGLISH BUTTER MARKET.

MONDAY, Sept. 27.

In the past week we have experienced rather a brisk Butter trade, which having brought an increased supply of both cask and fresh Butter, our market opens heavily this morning at declining prices.

Dorset, fine weekly ..... 90*s. to* 92*s. per cwt.*
Ditto middling ..... 70*s. to* 80*s.* ,,
Devon..... 80*s. to* 86*s.* ,,
Fresh..... 9*s. to* 11*s. per doz.*

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.		s.	s.
Friesland	90 *to*	92	*Cheese, per cwt. Cheshire*	50 *to*	70
Kiel	88	92	*Cheddar*	56	68
Dorset ..... *new*	94	96	*Double Gloucester.*	50	58
Carlow ..... ,,	80	82	*Single do.* ..	44	50
Waterford .... ,,	76	80	*Hams, York*	72	76
Cork ..... ,,	80	—	*Westmoreland*	66	72
Limerick ..... ,,	70	74	*Irish*	60	70
Sligo ..... ,,	78	—	*Bacon, Wiltshire, green*	62	64
Fresh, per doz.	10	12	*Waterford*	60	62

OILS.

Linseed, 29s. per cwt.; Rapeseed, English refined, 33s. 6d.; do., foreign, 34s. 6d.; brown, 32s. 6d.; Galipoli, per tun, 56*l.*; Sperm, 85*l.* to 87*l.* 10s.; do. bagged, 86*l.*; South Sea, 35*l.*; Seal pale, 34*l.*; do., coloured, 32*l.* to 33*l.*; Cod, 34*l.*; Pilchard, 28*l.* to 30*l.*; Cocoa Nut, per ton, 38*l.* to 40*l.*; Palm, 29s. 6d.

MANURES.

LONDON, SEPTEMBER 27.

LINSEED CAKES are very firm at our advanced quotations; and from the short supply higher prices are looked for as the season advances for consumption.

RAPE CAKES are wanted; no foreign on the spot.

PRICES CURRENT OF GUANO.

		£	s.	d.	*to* £	s.	d.
Guano Peruvian	*per ton*	0	0	0	9	5	0
In quantities under 5 tons	,,	0	0	0	9	10	0
Bolivian Guano	,,	7	5	0	0	0	0

ARTIFICIAL MANURES, OIL CAKES, &c.

Peat Charcoal	,,	2	15	0	0	0	0
Nitrate Soda	,,	15	0	0	0	0	0
Nitrate Potash or Saltpetre	,,	26	0	0	28	0	0
Superphosphate of Lime	,,	0	0	0	6	0	0
Soda, Ash or Alkali	,,	0	0	0	8	0	0
Gypsum	,,	1	5	0	1	10	0
Coprolite	,,	2	5	0	3	0	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping	,,	27	0	0	29	0	0
Salt	,,	1	1	0	1	5	0
Bones ½ inch	*per qr.*	0	0	0	0	15	0
,, *Dust*	,,	0	0	0	0	17	0
Oil Vitriol, concentrated	*per lb.*	0	0	0	0	0	1
,, *Brown*	,,	0	0	0	0	0	0½
Rape Cakes	*per ton*	4	15	0	5	0	0
Linseed Cakes—							
Thin American in brls. or bags	,,	8	10	0	9	0	0
Thick ditto round	,,	7	15	0	8	0	0
Marseilles	,,	0	0	0	0	0	0
English	,,	7	15	0	8	0	0

WOOL MARKET.

BRITISH WOOL.

BIRMINGHAM WOOL SALES, SEPT. 22.—The sales to-day were well attended by the leading manufacturers from Leicester and the north. Prices may be quoted as they brought in the market—for strong fleeces, 12¼ to 14½; fine clips, 14 to 16⅛; black, 13⅜; cots, 10⅞; locks, 8⅞ to 9½; and shorn lamb, 11⅞ to 12¾. About 40,000 fleeces were sold, and the sales were highly satisfactory.

LEEDS, Sept. 24.—There has been a moderate amount of sales of combing and clothing wools this week, at last week's rates, and prices are very firm.

LIVERPOOL, September 25.

		s.	d.	*to* s.	d.
Laid Highland Wool, per 24lbs.		9	6	10	3
White Highland	*do.*	12	9	13	9
Laid Crossed	*do..unwashed*	10	9	11	6
Do.	*do..washed*	10	0	12	0
Laid Cheviot	*do..unwashed*	11	6	13	0
Do.	*do..washed*	14	0	16	9
White Cheviot	*do.. do.*	24	0	26	0

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THE FARMER'S MAGAZINE.

NOVEMBER, 1852.

PLATE I.

PORTRAIT OF HIS GRACE THE DUKE OF WELLINGTON.

ENGRAVED BY J. B. HUNT, FROM A PAINTING BY R. LEWIS.

Arthur Wellesley, first Duke of Wellington, was born in Ireland in the spring of the year 1769. Singularly enough, there is a doubt both as to the day and place in which he was born. The first of May, however, for the one, and Dangan Castle, county Meath, for the other, are the most popularly accredited, though either has been met with many well-considered arguments against its claims. If Ireland thus ranks the hero amongst her many distinguished sons, the Mornington family, from which he descends, is still clearly of English extraction. The second Earl of Mornington, himself celebrated for his musical attainments, died when his son Arthur was yet at a very early age, and his education consequently was proceeded with under the direction of his mother, a daughter of Arthur Hill, Viscount Dungannon, a lady also of considerable talents. Yet the early promise of her son Arthur was by no means great, for both at Eton, as well as when afterwards with a private tutor at Brighton, he evinced anything but that success in elegant scholarship for which so many of his family have been renowned. In fact, his very inferiority in classic study is generally supposed to have led to his adoption of the army as a profession; as a preparation for which, we find him ultimately removed to the military seminary at Angers, in France. Having spent six years here, the student returned in 1787 to take up his commission as ensign in the 73rd foot. Once entered, the family influence was found sufficient to ensure him quick promotion, and his frequent changes from one regiment to another, consequent of course on "the steps" he took, would be only tedious to trace out. Of all those he joined, and they included both cavalry and infantry, his name is chiefly identified with the 33rd, in which regiment he obtained his majority, and which subsequently he commanded, that is in the early stages of his career. This was commenced in 1794, (where it finished many years afterwards—on the plains of Belgium); the 33rd being sent out in aid of the discomfited forces of the Duke of York. Colonel Wellesley's services here, however, were chiefly confined to the conducting of a retreat. In 1796 the same regiment, with which he continued in command, was ordered to India; but their colonel was unable to proceed with them, his health having failed him. It is indeed remarkable that the Iron Duke of mature age, was, as a young man, often nearly mastered by debility and sickness. Still he was enabled to join them early in 1792, in the February of which year he landed at Calcutta, and from whence we may date the commencement of those famous campaigns that resulted in the establishment of our Eastern Empire. We can do no more than thus passingly allude to those glorious nine years of successful soldiership—services which, only justly rewarded, sent the Colonel Wellesley of '97 home again in the autumn of 1805 as a Major-General and a Knight of the Bath, with the thanks of his king and country awaiting him.

For three years from this period Sir Arthur Wellesley occupied himself with the duties an Irish

secretaryship and a seat in Parliament entailed on him, turning again, in the summer of 1808, to those pursuits for which he was so pre-eminently fitted. England's "greatest war," however, and the victories of the Peninsula, crowned as they were with "Wellington and Waterloo," must speak for themselves. They have long been household words.

As a soldier the conclusion of this war left the Duke of Wellington amongst the greatest and most popular. His subsequent career as a statesman, while it could not endanger his real worth, for a long period lowered it in public opinion. As a General his judgment was almost always right, his actions almost as invariably successful. As a Prime Minister, on the other hand, he rarely carried out that he intended, and thus Catholic Emancipation and Parliamentary Reform were passed not at his direction, but conceded rather to the force of circumstances. The Duke himself well knew his true place in this arena, and it was not as a leader of a party, but as an uninfluenced adviser, that he regained to the full the general respect and admiration of his country.

No man's popularity, be it remembered, was ever raised upon a purer foundation. It was the result of one long line of duty, directed by ability and determination, and never turned from its course by personal consideration of any kind. It was in this spirit that the Duke could receive the highest honours a grateful people could bestow; as, with the same inward feeling of having done his best, he could hear the comments on the victory of Talavera, or point to his well-guarded windows in Piccadilly. The tide of public favour might ebb or flow, but it never tried his courage or altered his position.

His Grace married in 1806 the Honourable Catherine Pakenham, third daughter of Lord Longford. by whom he had two sons, the Marquis of Douro, now the present Duke, and Lord Charles Wellesley, The Duchess died in 1831.

PLATE II.

A COTSWOLD RAM,

The property of William Garne, Esq., of Aldsworth, near Northleach, Gloucestershire, for which the first prize of £25 was awarded at the Meeting of the Royal Agricultural Society of England, held at Windsor, in July, 1851.

METEOROLOGY, ITS CONNECTION WITH AGRICULTURE.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

In pursuing the subject of meteorology in its connection with agriculture, I propose in this paper to collect a few facts upon the evaporation, and filtration from the soil, of rain-water. Now, it has been ascertained by the result of many long-continued observations that the depth of rain-water evaporated from the surface of the soil in the warmer months of the year is always very considerable, though this varies with the nature and circumstances in which the soil is placed. Mr. John Dickenson, of Abbott's Mill, near King's Langley, in Hertfordshire, has given the mean amount which at that place fell, evaporated, and filtered or drained away: 1. In each month and year in the eight years from 1836 to 1843; and 2. The mean amount which fell, evaporated, and filtered in the half years extending from April to September both inclusive, and from October to March both inclusive, in the eight years from 1836 to 1843. These will be found in the following tables (*Journal of the Roy. Ag. Soc.*, vol. v., p. 150):—

Months.	Rain. Inches.	Filtrated. Inches.	Evaporated. Inches.
January	1·847	1·307	0·540
February	1·971	1·547	0·424
March	1·617	1·077	0·540
April	1·456	0·306	1·150
May	1·856	0·108	1·748
June	2·213	0·039	2·174
July	2·287	0·042	2·245
August	2·427	0·036	2·391
September.....	2·639	0·369	2·270
October	2·823	1·400	1·423
November.....	3·837	3·258	0·579
December	1·641	1·805	0·164
Total ..	26·614	11·294	15·320

April to September inclusive.

Years.	Rain. Inches.	Filtration. Inches	Evaporation. Inches	Tons per acre. Filtrated.	Tons per acre. Evaporated.
1836	12·20	2·10	10·10	212	1023
1837	9·80	0·10	9·70	10	982
1838	10·81	0·12	10·69	12	1082
1839	17·41	2·60	14·81	263	1500
1840	9·68	0·00	9·68		980
1841	15·26	0·00	15·26		1545
1842	12·15	1·30	10·85	131	1099
1843	14·04	0·99	13·05	100	1322
Mean .	12·97	0·90	11·77	91	1192

October to March inclusive.

Years.	Rain. Inches.	Filtration. Inches	Evaporation. Inches	Tons per acre. Filtrated.	Tons per acre. Evaporated.
1836	18·80	15·55	3·25	1574	330
1837	11·30	6·85	4·45	693	452
1838	12·32	8·45	3·85	855	393
1839	13·87	12·31	1·56	1246	159
1840	11·76	8·19	3·57	829	362
1841	16·84	14·19	2·65	1437	269
1842	14·28	10·46	3·82	1059	387
1843	12·43	7·11	5·32	726	538
Mean .	13·95	10·39	3·56	1052	360

There are influencing circumstances which vary the rate of evaporation ; for instance, the more or less amount of moisture which the soil requires for saturation, and its degree of exposure to the sun and winds. Then, again, the force of those winds, and the general direction in which they blow, have a very material influence on the extent and rapidity of the evaporation. I had a favourable occasion to notice this during some lengthened observations in Essex on a field of about 20 acres, which was devoted to the evaporation of sea-water for the purpose of making common marine salt. This field was divided into small, very level, shallow divisions (about 40 feet square), called by the salt-maker "sun pans," in which the sea-water was spread over the surface as thin as possible, so as to be gradually strengthened into brine by the action of the sun and winds (the mean depth of the water in these was about an inch). The attendants upon these "sun pans" soon became well aware of the varying influence of the wind on the rate of evaporation. They found that in a perfectly calm day, however bright and warm the sun shone, the evaporation from the water was very slow; but that a breeze much increased the evaporation from whatever quarter it came. Of these breezes those produced the least evaporation which were from the S.W. or W.; the rate of evaporation was greater if the wind was N.W., still more if N., still more if N.E. or E., and the most rapid of all in the warm and dry S.E. wind—but, then, this wind we found was generally soon followed by rain. Such observations are practically valuable, and chiefly, like most of a similar kind, as being *comparative* results obtained under *similar* circumstances. This remark well applies to such as those of Mr. Charles Charnock, carried on at Holmfield, near Ferrybridge, in Yorkshire, in the years 1842-3-4-5 and 1846. These show the relative evaporation: 1. Of surfaces of water; 2. Of undrained land or soil saturated with water; and 3. Of dry or drained land (*Journal Roy. Ag. Soc.*, vol. x., p. 517). The following table gives the mean results for the four years:—

Evaporation.

Year, and Depth of Rain in Inches.	From water. Exposed to both Sun and Wind. Inches.	From water. Shaded from Sun, but exposed to Wind. Inches.	From soil. When drained. Inches.	From soil. When undrained. Inches.	Water filtered away. Inches.
1842 .. 26·11	33·61	22·48	21·56	30·02	4·55
1843 .. 24·49	34·17	22·72	20·11	31·19	4·28
1844 .. 19·00	40·16	26·75	15·40	37·85	3·60
1845 .. 28·18	32·56	21·75	23·26	31·09	4·92
1846 .. 25·24	34·69	23·04	18·38	33·28	6·76

These experiments were carried on upon a magnesian limestone soil, and the drain was placed at a depth of three feet from the surface. The amount evaporated was here smaller than that recorded by Mr. Dickenson in the chalk soil of King's Langley, in Hertfordshire.

Some results, recorded by the late Mr. John Dalton, of Manchester, "with a good fresh soil," seem also to show a smaller extent of filtration than in the Hertfordshire results. In his observations, which extended through the years 1796-97 and 1798, he found the mean of those three years to be—

Mean rain	33·560
Mean evaporation	25·158
Mean filtration, or drainage	8·402

These researches bear exclusively on the amount of rain-water capable of being absorbed by various

soils, and to the degree of rapidity with which they allow it to evaporate. Another enquiry relates to the rate with which the same soils, when well dried, absorb the insensible vapour of the atmosphere; and this, although not strictly relating to our comparative meteorological observations, is still of considerable interest. One thousand grains of each of these earths, when exposed on a surface of 50 square inches, absorbed in 12 hours, 24 hours, 36 hours, and 72 hours—

	In 12.	In 24.	In 36.	In 72.
Siliceous sand	0	0	0	0
Calcareous sand	2	3	3	3
Sandy clay	21	26	28	28
Loamy clay	25	30	34	35
Stiff clay	30	36	40	41
Arable soil	16	22	23	23
Garden mould	35	45	50	52

In the examinations of the German chemist, and others which I have given, all the soils employed were free from herbage of any kind—it was the evaporation of the bare earths which was alone determined. In practice, however, a different state of things presents itself, we have there a soil tenanted by plants, and a consequent increase of evaporating surface, which is probably much more influenced by the action of the sun and winds than a surface of bare earth.

The larger evaporation from a soil occupied by plants was shown experimentally by Mr. Geo. Phillips (*Journal Roy. Ag. Soc.*, vol. vii., p. 307). He employed in the month of March two metallic vessels of equal size, which were used as mould pots. They were so constructed that no moisture could escape except at the surface. Each pot contained 22·09 square inches of surface at the level of the mould. One pot was filled with mould only, the other with mould containing a polyanthus, and, in another experiment, three plants of the potato. In twelve days the mould evaporated 1,600 grains, or 6·06 grains daily per square inch, while the pot containing the polyanthus had evaporated 5,250 grains, which, for the mould and one surface of the leaves, is 4·93 grains for every square inch. In the case of the potato plants, in nineteen days the mould evaporated 54,000 grains; the potato plants, 3,000 grains. The daily evaporation from one surface of the potato was at the rate of 1·4 grain, and of the polyanthus 2·1 grains, from one square inch. In the experiments of Dr. Hales on a sunflower, the daily mean evaporation was 15 grains for every square inch of the plant's surface.

The evaporation of water from the surface of plants is influenced, too, by the action of light, and this on certain elevations, and in particular aspects, is a circumstance which there is little doubt has a material influence on the prosperity or ill-success of certain crops. The action of light on the aqueous exhalation of plants has engaged the attention of Professor Macaire, of Geneva (*Trans. Royal Soc.*, 1848, p. 270). His observations confirm the generally received opinion that the exhalation is chiefly from the leaves. He found that the exhalation was much less in quantity during the night than during the day—that the influence of light upon the amount of exhalation was considerable, and that this varied materially according to the surface of the leaf exposed, and the rays of the spectrum in which it was placed. For instance, in two hours, a leaf of a raspberry bush, weighing 23 grains, placed on 300 grains of water, with its *under*-surface exposed to the light, in a temperature of 68 degs., exhaled—

	Grains of water.
In diffused light	4·3
In the blue rays	6·3
In the yellow rays	2
In the green rays	2
In the red rays	1
In the dark	0·4

Under similar circumstances, with its *upper* surface exposed to light, it exhaled—

	Grains of water.
In diffused light	2·2
Under blue glass	2·8
Under yellow glass	0·5
Under red glass	0·4
In the dark	0·0

In all the experiments the exhalation was greater in the blue rays than in the others, whether it was the upper or the under surface of the leaf that was exposed to the influence of light. The blue rays excite a greater exhalation than the diffused light; but this light has more influence than the other rays. The red is that in which the exhalation is the smallest.

We cannot fail to perceive then, that the evaporation of water from the earth, and from the plants with which the farmer's soils are tenanted, is a matter full of interest. We shall find hereafter that this more materially influences the modes of cultivation which he is led to adopt than we have always leisure to examine.

ON THE COMPARATIVE ADVANTAGES OF FIXED AND PORTABLE STEAM POWER, AS APPLICABLE TO THE PURPOSES OF A FARM.

BY MR. JAMES D. FERGUSON, BYWELL CASTLE, NEWCASTLE-UPON-TYNE, FORMERLY AGRICULTURAL ENGINEER IN GLASGOW.

[Premium—The Medium Gold Medal.]

The writer, in stating his observations in reference to the comparative advantages of fixed and portable steam-power, as applicable to the purposes of a farm, believes he will best convey his opinion in respect to them by dividing this paper into four sections—viz.:

1. Steam applied to the plough.
2. Fixed steam-power applied to thrashing-machines, turnip and chaff cutters, &c.
3. Portable steam-power applied to do. do.
4. Portable horse-power applied to do. do.

Steam-power applied to the plough is, the writer believes, of very recent origin, and, so far as he is aware, the first attempt on a large scale was made some years ago in Lochar moss, near the town of Dumfries. On that occasion many thousands were witnesses of the exhibition, and the writer happened to be one of the number, whose opinion, like many others, in respect to the utility or general advantage of the steam-plough, was by no means favourable. There was evidence, certainly, of a curious and most ingenious piece of mechanism, not only in the engine and its connections, but in the working of the plough; which, however, went but a short way as compensation for the many defects which appeared in the working of both.

On the whole, it was the general opinion at the time that it did its work very imperfectly; and, in consequence of the many obstructions in the soil which it met with—the iron belt which pulled the plough being continually breaking, as well as other parts of the machinery, and, consequently, much time being lost and expense incurred in making repairs—it is the deliberate opinion of the writer, that, except for large level tracts of moss or bog, or for large enclosures on extensive level or carse farms, where there are no obstructions in the soil to hinder the free working of the plough, it cannot be brought into general use for the majority of tenants, especially as the great weight of the engine as well as its expense, will constantly operate to its disadvantage; for if the engine is fixed in the middle, or at one end of the field, and the plough or ploughs pulled by flexible iron belts similar to the one exhibited near Dumfries, it (the engine) will necessarily be expensive, as it must of necessity be heavy to resist the lateral pressure; and if the engine is made to travel with or in company of the plough, which may be done on dry ground, two or probably three horse power would be expended in dragging the engine itself. All these would materially operate against its general application. In a district of country, however, where there are large enclosures and extensive carse farms comparatively level, of loamy or clayey soil, and no likelihood of the plough meeting with any formidable obstruction in the subsoil, a steam-plough might, the writer is positive, be introduced, and advantageously employed, on the principle of the portable steam engine for thrashing, the proprietor of the engine and plough hiring them out from time to time to parties—he charging a certain amount per day or per acre, according to the quantity ploughed, the tenant affording fuel or not, as the case might be.

He would feel very sorry to discourage any invention, by which the labour of cultivation to the farmer would be cheapened; but as respects the application of steam to the working of the plough, he has, like many others, his doubts of its ever being of general advantage to the majority of tenants.

Steam-power, however, both fixed and portable is, and may further be of the greatest advantage to tenants, in driving thrashing-machines, chaff and turnip cutters, &c.; and first in respect to *fixed* steam-power, which in the end (compared with a portable engine) is not only for farmers of moderate or large extent the cheapest, but steadiest and best. The writer believes himself to be in a position, if not satisfactorily to prove this, at least to give a very decided opinion in reference to it, more especially as it has been his lot not only to attend to various kinds of thrashing-machines driven by horse-power, as well as by fixed and portable steam-power, from a portable one driven by four horses, up to one of twelve-horse power worked by a high pressure steam engine, and not only had to feed these machines, but occasionally to attend in the corn-barn, as well as to assist in bottling or taking away the straw. He therefore had the fullest opportunity, from several years' severe prac-

tical experience, of observing the advantage and disadvantage of these powers, when applied to thrashing-mills.

There can scarcely be two opinions in respect to fixed steam-power being decidedly the best for all corn farms of moderate extent—of say 100 acres or upwards ; and his opinion is founded on the following observations :—A high pressure engine, of four-horse power, which is sufficient for a farm of 100 acres, can now be obtained, with boiler and connections, for £90 ; and although an engine-house, with a chimney of considerable elevation, is absolutely necessary, yet the expense of all these, when compared with the inconvenience and disadvantage of a portable engine for a farm of the size stated, is actually not worthy of consideration. A fixed engine, under cover, is easily kept and attended to, at the rate of about 6d. per day for oil and greese, &c., and is, of course, perfectly steady in its movements when working; while a portable engine, on the contrary, is often the very reverse, being fixed on four wheels ; and this of itself is of much importance to notice, and, at any rate, it is generally more expensive for maintenance in tear and wear, &c., and also for oil and grease, in consequence of its exposure to all weathers, being generally put down at the barn door while working.

It is always a matter of considerable importance to the industrious tenant, that he should have it in his power to turn his servants to some in-door work during stormy weather, when it may be improvident to send men and horses into the fields ; but if he has a good thrashing-mill, and a fixed engine to drive it, he can never be at a loss in the winter season. He is then comparatively independent. He can get up his steam by daylight in a winter morning, and by thrashing a whole day at once (as every good managing tenant should do, to save fuel in raising the steam), he procures not only abundance of fodder for his stock (which, if stored carefully, will keep fresh a considerable time), but a large quantity of grain, which, if need be, he can store past, to meet a rising market.

The tenant, however, depending on a portable engine to drive his thrashing-mill, is often not in such a favourable position as his neighbour having a fixed one of his own. These, in England, are generally kept by parties in the district, who hire them out to tenants at so much per day, or at the rate of so much per bushel, or other measure, according to the kind of corn or length of straw which is thrashed. The engine is generally of four or six horse-power, and is fixed on a carriage haveing four broad wheels. When a farmer requires the use of this engine, it is necessary that he give notice to the owner of it a few days before it is wanted, and then send two horses (sometimes three are necessary) to drag it the evening before it is wanted, or early on the morning it is to be at work, in order that there may be sufficient time to get up the steam. It is generally set down at the outside of the barn door, and the thrashing-mill driven by a long belt from the fly-wheel of the engine, put over the pulley or sheave of the drum. It is, however, a complaint almost universally made, that in consequence of the engine being fixed on a wheeled carriage, it works usually in a very unsteady manner; and it is not uncommon that derangement and breakage of the thrashing-mill takes place, as well as sometimes of the engine itself.

There are other serious objections to a portable steam-engine; and, first, the risk of fire by sparks flying about, (which can scarcely be avoided, although some of them are encased in sheet iron); and this of itself is a great objection to its use. Another and serious complaint is, the great inconvenience a tenant is sometimes put to (especially when markets are looking up) in not getting the engine on the day he wants it; for if only one is kept in the district (and in some districts two would not pay), there is often such a demand for it, that four or five, and even sometimes six days' notice, require to be given before the use of it can be obtained ; and it not unfrequently happens that, before a tenant can get his corn thrashed and ready for the market, grain has again fallen in price.

This the writer has sometimes noticed, and with regret observed the great hindrance it often was to the industrious tenant making the most of his corn crops when markets were rising ; whereas, had he had a fixed engine of his own, as, in the opinion of the writer, every tenant possessing a corn farm of 100 acres and upwards should have (if water, which is the cheapest of all power, cannot be obtained), he would always be in a position to catch a favourable market for his grain, and this of itself would go far, even sometimes in one season, to counterbalance the rate of interest on the original price of the engine, and buildings connected with it, even although he should build them himself. The writer remembers at one time of a tenant (he having a farm of considerable extent, but no thrashing mill) being disappointed in getting a portable horse-power gin and thrashing-machine at the time he required it (and this, by the by, which is also hired out and conveyed from place to place, is ready for work in one half the time that is required for a steam-engine, considering the time that is necessary to get up the steam), who set a few men to thrash out his corn by the primitive method of flails, rather than lose the opportunity of exposing his grain for sale at a favourable market.

The usual prices of fixed high-pressure steam-

engines are as follows: one of four-horse power, with boiler and connections, will cost £90; one of six do.; £110 eight do. £130; ten do. £150; twelve do. £170. To build the engine-house chimney 40 feet in height, erect engine and boiler house of bricks, 20 feet in length by 14 in breadth, and set up the engine of any of the above, will be, allowing the materials to be brought or carted say ten miles, and the roof a slated one, about £130.

A four-horse power fixed high-pressure steam-engine will thrash and dress with a good mill, in a day of eight hours, with 4 cwt. of the best coals (or a cwt. for each horse-power), from 250 to 320 bushels of wheat, if the crop is a good one, and reaped in fair condition.

A six-horse power, do. do., will thrash and dress in the same time, with 6 cwt. of coals, from 290 to 370 bushels of wheat.

An eight-horse power, do. do., will thrash and dress in the same time, with eight cwt. of coals, from 330 to 420 bushels of wheat.

A ten-horse power, do. do., will thrash and dress in the same time, with 10 cwt. of coals, from 420 to 600 bushels of wheat; and

A twelve-horse power, do. do., will thrash and dress in eight hours, with about 12 cwt. of coals, from 600 to 800 bushels of wheat.

It may not, perhaps, be out of place to detail here the number of hands generally employed at this powerful mill of twelve-horse power when working, which was undoubtedly the best the writer ever saw for farm purposes, although there was nothing peculiar in its construction. The feeding rollers were 6 feet in length, and the shaker (called a travelling shaker), which was horizontal, sparred across, and 14 feet in length, had a peculiar tremulous motion given to it by machinery, which, when the straw was thrown on to it by two common revolving rake shakers, made the corn pass through it into the hopper of the fanners below, while the straw was moved along by the power of an endless chain, which revolved round cylinders at each end, and made it drop over the partition wall, 14 feet in height, that separated the corn from the straw barn. It was the lot of the writer often to feed this machine, which always wrought a day at a time, and which was exciting although severe work. The number of people required for the machine while thrashing, and to prepare the corn for the market at the same time, and put it into sacks, which was always done, was as follows:—

One man to attend the engine—two and a half, and sometimes three hours, being generally required in the morning to get up the steam, if the coals were good.

One do. to feed the mill.

Two women to unloose the sheaves; one on each side or the feeder.

One man (sometimes a woman) to cast the stack.

Two lads to cart the corn from the stackyard, if the stack was at a distance. The upper floor of the barn being on a level with the stack yard, in the end of which was a coach-house door, loaded carts were run back to the feeding-board.

One man in the corn barn; generally the steward.

Three women in do. do., a pair of hand-dressing fanners being kept going.

Two men taking away the straw. If bolted, four were required.

Two women building and trampling the straw in the end of straw barn.

The prices of portable steam-engines, with carriages, are as follows—viz.:

A four-horse power portable steam engine, on a carriage with four broad wheels, will cost £220; and with a thrashing-mill and shaker attached, but without fanners, £55 additional.

A six-horse power do. do, do., £250; and with a thrashing-mill and shaker attached, but without fanners, £63 additional.

The writer has not seen any of greater power than the above, which in England are dragged about the country; but it is not uncommon that a thrashing-mill is conveyed from place to place along with the engine, the whole belonging to one person, who hires them out from time to time. When this is the case, the thrashing-mill, which is also fixed on a carriage, is run back into the barn, which in many parts in England is built of wood, and has generally a large door on each side, and when made steady on the floor, is driven by a long belt from the fly-wheel of the engine, which is planted at the outside of the door. Sometimes the thrashing-mill has a pair of dressing fanners attached, but oftener the corn is only thrashed; and sometimes a farmer has a fixed thrashing-mill of his own so constructed, with, and sometimes without fanners, that the engine which he hires to drive it can be easily attached to the sheave or pulley of the drum, and driven by a belt.

A four-horse power portable engine will thrash in eight hours, with a good mill, from 240 to 300 imperial bushels of wheat, if well got, or nearly as much as a fixed engine; but, generally, the portable machines, as before observed, are not so steady as those fixed, and consequently do not do so much work.

A six-horse power portable engine, with a good mill, will thrash in eight hours, from 270 to 350 bushels of wheat, if a good crop, and reaped in fair condition.

The prices paid for the hire of portable steam-power thrashing-machines are:—The hire of a four-horse power engine with thrashing-mill, runs generally from 10s. to 20s. per day, if only a few hours of it are required, and according to the state and condition of the crop to be thrashed, and sometimes 1d. per bushel is paid if two days' thrashing are required; but, in the latter case, the owner of the engine and mill, whose duty is generally to attend the engine, affords or supplies a man to feed the mill, and the farmer finds fuel for the engine.

The hire of a six-horse power engine and thrashing-mill runs from 15s. to 25s. per day, or according to the length of time the engine is working; but the price of 1d., and sometimes as high as 1½d. per bushel, is more frequently the arrangement made with the owner of the engine.

The party hiring is generally at the expense of carting the engine and the mill to his steading when it is required; and in some districts it is common for the farmer last using them to send them with his horses to the next person hiring.

When the thrashing-mill is a fixture, and belonging to the farmer, as is the case in some places, the hire of an engine is then only required, and in that case the price paid for its use is, of course, proportionally less than when both engine and mill are required.

The prices of portable horse-power thrashing-machines are:—A portable horse-power thrashing-machine, with gin for two horses, including price of the carriage on which they are conveyed, the mill thrashing the corn merely, will cost £60.

A four-horse do. do. will cost £82.

A six-horse do. do. will cost £95.

A two-horse power machine will thrash in a day of eight hours from 150 to 240 bushels of wheat, according to the condition in which the crop has been reaped.

A four-horse power machine will thrash in the same time from 210 to 300 bushels of wheat, according to the condition in which the crop has been reaped.

A six-horse power machine will thrash in the same time from 260 to 350 bushels of wheat, according to the condition in which the crop has been reaped.

The prices paid for the hire of portable horse-power machines with horse gin are:—The hire of a two-horse power thrashing-machine with gin for two horses (the horses belonging to the party hiring), runs from 10s. to 15s. per day; but oftener 1d. per bush. is paid for the quantity thrashed, and sometimes more, according to bargain, the owner of the machine feeding it, and the farmer affording a man or boy to drive the horses.

The hire of a four or six-horse power machine and gin is proportionally more, and runs generally (but much depends on the state or condition of the corn to be thrashed) from 12s. to 16s. or 18s. per day, or 1d., and even sometimes 1½d. per bushel, the owner invariably feeding the machine, and the farmer supplying the horses and other hands for the work, as well as in conveying the machine and gin to the next person requiring them.

The writer has known in some districts the owner of the gin and thrashing-machine keeping two, three, or four horses of his own for conveying it and the gin from place to place, as well as for working it; but when this was the case, the charge was, of course, considerably increased—generally 4s. per day for each horse—in addition to the charge per bushel for what was thrashed, and that over and above feeding the horses, which devolved on the party hiring. This, however, is only in districts where the farmers generally are unwilling to allow their horses to be put into a horse-gin for thrashing, which they justly reckon very severe for them; consequently fixed steam power is now becoming general, especially in good agricultural districts, where coals for fuel can be had at a reasonable rate; for the farmers begin to find, that when an engine is employed for thrashing, chaff and turnip cutting machines, and corn-bruisers, &c., can at the same time be driven by it, as well as a pump in a urine tank for irrigation, about which a great deal of late has been said and written.—Highland Society's Journal.

TRIAL OF AGRICULTURAL MACHINES AT GENEVA, UNITED STATES.

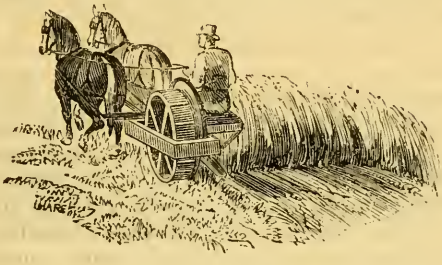
The trial of agricultural machines took place on a large farm two miles south-west of the village of Geneva, under the direction of the New York State Agricultural Society, during the six days from the 20th to the 26th of 7th mo. (July) last. The importance of such a trial has long been felt; and the interest in its results was manifested by the hundreds in attendance, chiefly of the most intelligent farmers of that region, during the busiest season of their labours.

Our state fairs have for many years exercised an excellent influence, by showing to the whole community the best implements and machines from the most skilful manufacturers, and serving to introduce them into many neighbourhoods where they were before quite unknown. The benefits

thus conferred, and the improvements introduced, are almost beyond estimate. Yet a great deficiency was felt in not seeing these machines and implements in actual operation. They may have a very promising appearance; but shrewd farmers, who dread humbugs, are not satisfied with simply gazing upon them motionless. Practical trial alone reveals the difference between a mower which will cut freely and shave like a razor, and another which chokes, tears, and slides over the uncut grass. A remarkable instance of this sort occurred in the case of M'Cormick's reaper remaining on exhibition at the world's fair, which afforded abundant sport to the London *Times*, as a cross between Astley's chariot and a flying machine, until, by the demonstration of actual trial, it elicited the admiration and astonishment of the British people. Some instances of an opposite character have also occurred, which it would be rather ungracious to mention. For such reasons as these, we are induced to regard the exact and thorough experiments made at Geneva, although not of a showy character, of eminent utility and of the highest importance, even if accompanied by some imperfections necessarily consequent to what is new.

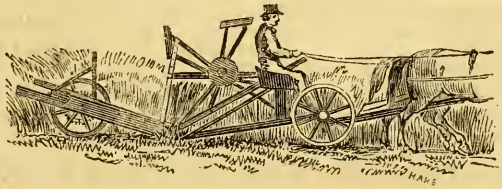
THE MOWING MACHINES.

The whole of the 20th was occupied with the trial of mowing machines, in the presence of nearly a thousand spectators. The meadow was rough, and the crop much too light generally for a



[Back view of Ketchum's Mowing Machine, in operation.]

fair trial: the small wiry grass was a severe test for the cutting powers of the several machines. Ketchum's (from Buffalo), M'Cormick's (from Chicago), Manny's (from Northern Illinois), and Rugg's (from the same region) were successively tried. Ketchum's was much approved for its simplicity of construction, and the clean cut which it made, shearing off evenly all before the sweep of its blades. Its swath was nearly five feet wide, and was laid with perfect evenness over the whole surface of the ground, and entirely obviated spreading. The only objection we heard was, not cutting sufficiently close to the ground; but several farmers remarked that, taken as an average, it was done as well as men could be hired to do it by hand. M'Cormick's did not succeed so well, cutting neither so clean nor so near the surface; but in heavier portions of the meadow, its work was good. Its swathe was six feet. Manny's "Northern Illinois Mower" was next tried, and



[Manny's Mower.]

did its work in beautiful style, fully equalling, if not excelling, Ketchum's, cutting a swathe over five feet in width. The general opinion was, that it was of quite easy draught to the horses; but this point could be determined satisfactorily only by the dynamometer, which the committee carefully applied to each machine, and the results of which will be embodied in their report. This mower possessed the decided advantage of admitting a quick and easy elevation of the cutting blades (situated midway between the forward and hind wheels), on approaching any obstruction.

We could not but observe the different form of the blades of each of these three mowers. In Ketchum's, they were acute-angular, as shown in Fig. 1; so that, although they had but a

Fig. 1.

Fig. 2.

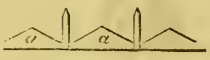
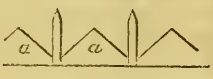


Fig. 3.



simple *cutting* edge (and not a sickle or sawing edge, as the others), they did their work completely: not a stalk of grass could escape them, as they quickly vibrated between the steel fingers. Even when a part of the cutters had accidentally become badly dulled against a hidden stone, we observed that none of the grass was left: it was pinched off, if not cut off, and a smoothly-shorn surface left. This appears to be a decided advantage, an increase in draught being the only result from dull knives. M'Cormick's, which has the sickle edge, is quite unlike in form, the angles being obtuse, as in Fig. 2. This appears to furnish the reason why this machine, which operates so admirably as a reaper, partially fails in the meadow, where the slender, polished surface of small wiry grass is operated on by the simple *sawing*, and not shearing, motion of the blades, but is bent down before them. In Manny's mower, which cut so much better than M'Cormick's, the angles were more acute, approaching in form those of Ketchum's (Fig. 3).

[Rugg's Propeller.]

Rugg's machine differed from all the rest in being directly propelled by the horses behind. Its cutting apparatus was similar to that of M'Cormick's, and it cut grass quite as well. It required more skill in driving, but less speed than any of the others, which was perhaps owing to the great multiplying power of its wheels.

The next morning, two more machines were tried—Burrall's, and Bronson and Murray's. Burrall's is quite similar to Ketchum's, and cut remarkably well, with the exception of becoming frequently clogged—a difficulty which may be yet obviated, as it was then on its first trial. Bronson and Murray's, being out of order, did not succeed well. Another trial of most of the mowing machines was made, in a heavy meadow, on the morning of the 23rd. On the lower portions the ground was rough, and the grass largely mixed with sedge and juncus, rendering it hard to cut. Ketchum's and Manny's machines did their work well, and cut closely to the surface. M'Cormick's, Bronson and Murray's, and Danford's did not succeed so well. The latter was now tried for the first time. Its cutting apparatus was quite different from the others, consisting of two sets of knives, vibrating in opposite directions, and operating like double-edged shears. High hopes had been entertained of the success of this machine; but they were not realized. This may have been owing partly to the absence of fingers to gather and hold the stalks, and to keep the edges from being crowded asunder. A portion of the grass on this meadow was completely prostrated; and here the superiority of the mowing machine over the scythe was most strikingly exhibited. Against this lodged portion Ketchum's mower was driven. It left the grass, in appearance, precisely as it was before; but it was found, on examination, to be shaved off close to the surface of the ground, without altering its position.

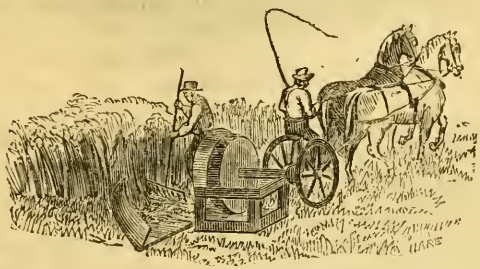
A single trial like this can hardly be considered as a decisive exhibition of the relative merits of the different mowers, where so much may depend on the nature of the ground and grass, the character of the team, driver, &c., while the liability to wear and tear will not be shown by the work of one day only. One point, however, was satisfactorily settled—the practicability and great advantage of the use of mowing machines on large farms, where one person, with a single team, can easily accomplish the severe labour of ten men. Indeed, it was a matter of surprise to many that, while grass-cutting by hand is much slower work than cradling, reapers requiring two men each should be so much more generally introduced than mowing machines, which cut nearly as many acres per day, with but one man each for their management.

One defect appears to exist in nearly all the

mowers—that of requiring unnatural speed in the horses to do the work well. The motion of the knives should be so multiplied as to accomplish the desired end with two miles an hour, instead of four. Excellent teams were purposely procured for all on this occasion; and the experiment can hardly be regarded as a fair one for ordinary every-day work.

THE REAPERS.

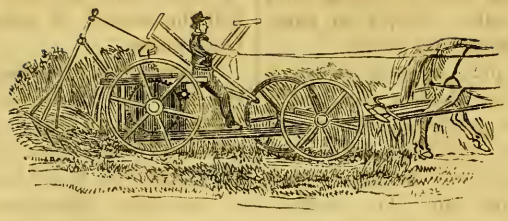
The trial of these was commenced in the afternoon of the 21st. Burrall's, of Geneva, first entered the harvest-field, and cut in fine style, sweeping down a sheet of the standing grain about five feet wide, and throwing it off in handsome bunches for binding. It could be so arranged as to drop the grain either directly behind, or off at one side; the latter being the best arrangement, as not requiring binding and clearing the track before the horses could again pass round the field. This machine, which appears to be much like Hussey's, possessed one advantage, which appeared to be an important one. By each vibration the knives were made to pass two sets of fingers, instead of only one, as in the others, cutting twice as much at each stroke, striking more rapidly, and rendering a change of motion less frequent. Hussey's machine was next tried; and its operation was fine, quite similar to that of Burrall's, dropping the grain behind the machine. Neither of these machines was furnished with a reel, which may have been the reason that it was necessary to drive the horses at a rapid pace—too much so for all-day work with ordinary teams. Rugg's Propeller did not succeed well, and was soon withdrawn from the field. Manny's Northern Illinois Reaper, a slight modification of his mower, which cut so well upon the meadow, succeeded equally well as a reaper. The grain was thrown off at the side. This was thought by some who witnessed its operation as the best *combined* machine, or for using both as mower and reaper; although, for the latter purpose alone, it hardly came up to some others. It may not prove practicable to combine these two qualities to the best advantage in one machine, but it is certainly well worth the attention of inventors; for, while the cost is from 110 to 135 dollars, farmers will not be willing to purchase two, when one can be made to answer the purpose. We do not perceive, however, why the price should be nearly so high.



[Burrall's Reaper.]

Densmore's machine, from Brockport, excited much interest. Its construction is not unlike M'Cormick's, with the addition of a self-raking apparatus, which suddenly throws off the grain at one side, as soon as enough has been cut for a bundle, thus saving the labour of one man, required, with the others, to rake off by hand. Some improvement is needed, however, in this self-raker: in light, erect grain, it lays the bundles tolerably well; but, when heavy, they are often spread in streaks. One of the best machines in the field was M'Cormick's. Like Manny's and Dinsmore's, it cut about six feet wide, and in execution was not exceeded by any, especially in "lodged" grain. Seymour and Morgan's machine, from Brockport, cut well, but, like some others, did not clear well, which might be owing to the inexperience of the raker. All these reapers appear to be quite similar in principle, if not in construction; Burrall's and Hussey's being furnished with acutely-formed cutting edges to their knives, and without reels; and all the others possessing sickle-edged cutters, and the machines furnished by reels. The vibrating knives and the reels appear to be both quite old inventions. Hussey's, M'Cormick's, and Burrall's appeared to be the favourites of this day's trial.

On the 22nd, Danford's Double-edged Reaper was put in operation. Its principal defect was, not cutting off the straw well, probably in consequence of having no fingers to gather and hold the grain, and to keep the blades in close contact while working together. In other respects, it was a neat and compact reel machine. At the same time, the self-raker presented by J. S. Wright, of Chicago, was tried: it was truly an extraordinary curiosity, and excited the highest interest. The self-raking machine (attached to Hussey's Reaper) is the invention of J. Atkins, of Chicago—a person of great



[Atkins' Self-raker.]

ingenuity, as this contrivance fully testifies. The rake sweeps the bed where the fallen grain is deposited, presses it against a toothed plate, and both, holding firmly the bundle of grain thus collected, swing round the quarter of a circle off behind, when they open wide, and drop their contents in a neat bunch upon the ground. All these motions are accomplished by a very simple piece of mechanism; and they seem so nearly the immediate result of intelligence, that this machine was generally called by the name of the "Automaton Reaper." Its invention is quite recent, and it had scarcely ever been used before; and hence, owing to an accident, it did not succeed the first day of its trial. It was, however, repaired, a temporary reel attached, and tried again on the 23rd, with entire satisfaction, proving decidedly the best *self-raker* on the ground. With further experience, it may become a great acquisition. If a good self-raker can be brought into use, it cannot fail to be adopted; for farmers will be quite unwilling to employ two hands to man a machine that will work equally well under the care of one.

The afternoon of the 22nd was occupied with the reapers in the barley-field—a piece of ground still more uneven than the wheat-field. A first-rate *cradler* had laid several swathes to divide the measured portions or acres: it was observed by all how greatly superior was the operation of the reapers, in evenness, in not leaving a straw behind, and in the precision with which the bunches were deposited. Several machines were tried; and all, or nearly all, did their work in the most finished manner.

On the whole, the trial was a complete triumph of machinery over hand-work, for both mowing and grain-cutting; and when machines shall be perfected, simplified, and rendered much cheaper than at present, mowers and reapers must become as indispensable on all farms of moderate size as horse-rakes, ploughs, and thrashing machines. Out of the many hundreds who witnessed the trial, we heard only a single adverse expression—from a strong-boned, rough-looking labourer, who remarked in an under-tone, when he saw the partial failure of the most defective machines, "I want nothing better than a good cradle!" Doubtless, had he witnessed the first experiment with the cast-plough, he would have exclaimed, "A good spade is enough for me!"—American Cultivator.

THE GUANO QUESTION.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, ETC.

The guano question acquires great and increasing interest. The *Premium*—if so it may be called—offered by the Royal Agricultural Society, having roused the energy of those zealous friends of agriculture who alone are capable to determine, by chemical analyses, whether a substitute for pure foreign guano can, or cannot, be prepared *at home at a cost not exceeding £5 per ton*, and in quantity sufficient to meet the demand of the farmer, supposing *that* to amount to *five times* the weight of the foreign genuine article sold by Messrs. Gibbs and Co., at the price of £9 5s. per ton. On, or about, the 14th of July last, I ventured to *suggest* to the Guano Committee of the Society, that if an attempt were made to furnish a substitute so desirable, with a rational prospect of success, it must be grounded upon a thorough knowledge and imitation of all the chief fertilizing elements of the most approved Peruvian guano. These elements have been sought for, eliminated, and faithfully announced by several eminent professors of the day; and now, therefore, the great problem of a home-supply remains to be solved.

Before offering an opinion on the subject, it is needful to solicit attention to an article on the *guano question* which appears in the last published number of the *Edinburgh Quarterly Journal of Agriculture* (October inst.), because it contains facts of very great moment. I know the writer—his thorough practical acquirements in every branch

of agriculture, and untiring spirit of investigation; and therefore it might suffice simply to name him, but I on that point respect his silence.

Extract I. "The fixed price of guano has now settled down to £9 5s. a ton. At that price, and at 3 cwt. per acre, the cost of applying guano to the land is about 30s. an acre; and it is a curious coincidence that the returns of crops manured with it amount to just about that sum. For example, 3 cwt. increase the wheat crop, according to Mr. Hudson, of Castleacre, 6 bushels, which, at 40s. the quarter, just gives a return of 30s. The use of guano, at present, may thus be said to be accompanied with no profit to the farmer, so that every shilling of reduction in its price below £9 5s. a ton would be so much gain to him. Now, how is a reduction of its price to be effected?"

Extract II. "The quantity imported into this country in 1851 was 130,580 tons. But, after all, it appears that the Messrs. Gibbs sold, last season, only 87,891 tons, and had 42,689 tons on hand to meet the imports of 1852, which shows that the actual consumption of guano in this country is not very great." But now comes the onus of the question, as will appear by

Extract III. "It is obviously the interest of the Peruvians to encourage the trade in guano to this country; and were they in a situation merely to impose an export duty on guano, they would derive a handsome revenue from the trade *at one pound* a ton *of duty*, were the importation doubled or tripled. But, unfortunately both for the Peruvians and this country, they cannot allow the guano to be taken away at a low duty. *The British creditors of the Peruvian nation will not allow them to do it. Their* debt must be paid, principal and interest, before the Peruvians can extend their trade in guano. £1,200,000 of debt was contracted in 1822, and £616,000 more in 1825. The rate of interest agreed on was six per cent.; but no dividends were paid from October, 1825; so from that date to 1849 the interest accumulating amounted to £1,816,000. At last it was discovered that the guano was a valuable manure in *this* country, and that the deposits of it would prove to be an enormous source of revenue to the state. This gave new spirit to the cause; and, after repeated remonstrances, in January, 1849, rapid progress was made in an arrangement."—(*See Fortune's Epitome of the Funds*, p. 218.) By this a fund was created of active debt of £1,800,000 (being the original debt) at six per cent., and a deferred debt of £1,900,000 (being the accumulation of interest at three per cent. Both kinds of debt amount at present (1852) to £3,300,000. The guano sold at £9 5s., after deducting the charges and value received for it, was, in 1851, £4 4s. 7½d. per ton, with which the dividends of stock are paid, the debt gradually redeemed, and half the amount of sales is sent to the Peruvian Government."

We thus perceive the situation of affairs; and therefore find it needless to dwell upon those schemes and calculations by which some have proposed to lower the import duty of guano, to increase the demand for it, and to provide for the extinction of the debt. One more and the last quotation from the *Quarterly Journal* will explain our writer's view of what might lead to a very profitable arrangement between Britain and Peru: "*Let the Government pay off the Peruvian debt at once*, and let the guano be brought into this country for £1 per ton import duty—a sum quite sufficient for the Peruvians to realize a large revenue from their guano deposits—and it would be all profit to them. We maintain that the agriculturists of this country have a right to make such a demand upon Parliament to pay for them the sum of three millions in one year, when they were deprived of ninety-one millions a year for ever, by a bold act of the legislature. With such an arrangement, embracing the probable reduction of freights, and a trebled importation at that low duty, the guano could be imported at £4 per ton; a sum which would most probably induce the use of a trebled quantity, and would leave a profit of not less, perhaps, than £6 upon every ton used by the farmer by a corresponding increase of produce."

Were this simple plan adopted, the results might be astonishing; but here two questions present themselves to the cautious inquirer. 1st. Would our Government accede to—would the nation permit the sacrifice of a sum so large as £3,000,000 as an experiment which might involve much hesitation and perhaps bad faith? Again, do we know the amount and probable duration of the guano deposits? for authorities are conflicting on that point. A learned Professor told me, only a few months since, that, at the rate of our existing supply, the stock could scarcely hold out for twenty years; whereas, our author, at p. 492, estimates the actual deposits at thirty millions of tons, besides those not yet surveyed!

As respects any proposed substitute, it certainly appears to me, and I believe to others, more than improbable that any process of artificial combination can ever produce an available representative of true guano. We entertain hopes that our capital system of drainage, so ably conducted by the Croydon Board of Health, might have produced a vast quantity of solid manure of highly fertilizing quality; but it is feared that as all the *fluid sewage* is conducted by a series of stoneware pipes into a feeder of the Wandle, a loss of almost the whole of the ammonia, and other soluble

salts with fixed alkaline bases, is sustained, leaving a great bulk of the solid matters comparatively effete and useless. Time will prove the real fact; but unless a due supply of *peat carbon* can be obtained at a low price, it will be in vain to attempt a deodorization of the offensive solid deposit; for lime tends entirely to expel the small quantity of ammonia which may remain in the mass.

To imitate guano, the neutral salts, soluble in water—namely, sulphate, phosphate, muriate, perhaps oxalate of ammonia, potass, and soda—should be introduced; and it must ever be remembered also that the solid matters comprise the bone phosphate of *fish* reduced to the finest state of division in the alimentary organs of sea-birds, and a large per-centage of insoluble *urate of ammonia*. Who then can entertain a rational hope of compounding any manure worthy of competition with the guano of Peru, and at a cost not exceeding £5 per ton!?

If it were possible, by negotiation, to induce the Peruvian Government to lower the duty to £1 per ton (even were the debt not paid off), then, should the importation increase to five times its present amount, the revenue would be enormous, and sufficient also to cancel the debt speedily.

But even under such most desirable conditions, we might anticipate perplexing contingencies. I trust that enough has been said to induce extensive investigation and a due comparison of facts.

Oct. 25.

THE EFFECTS OF THE NEW GOLD FIELDS ON AGRICULTURE.

In 1492 Columbus sailed on that adventurous voyage which resulted in the discovery of America. By 1599 the great revolution in prices which flowed from that expedition was complete. There is considerable difficulty in ascertaining, with any approach to accuracy, the extent of the change; so loose is our knowledge of the general prices of commodities in those times, so great the confusion respecting the value of weights and measures to which those prices refer, and so great the variations in the quantities of gold and silver contained in coins of the same denominations during different portions of the period. After striking off, however, that portion of the enhanced price which was not real but nominal, there appears little doubt, that in England, by the end of the 16th century, thrice the quantity of silver was requisite to purchase the same amount of necessaries and luxuries, as before the discovery of America, or rather before the opening of the silver mines of Potosi. In France and Spain the advance of prices appears to have been even greater. In Spain it is calculated as five-fold; and in France four-fold. This difference in different countries is no more than might have been expected. The commerce which has made England the richest country in the world had then no existence. There were not the same facilities as now for the transfer of the precious metals from country to country. In Spain, from its connexion with the sources of supply, they would accumulate the most: and between France and Spain there was more intercourse than between Spain and England.

The absolute amount of the precious metals by which this revolution in prices was effected is an interesting subject of inquiry, in which, however, we must be content with much that is conjectural, for accurate statistics there are none. Humboldt estimated that the total quantity of gold and silver derived from America, to the end of the year 1599, amounted to £138,000,000, after allowing for loss by the wear of coin. The greater portion of this sum was obtained after 1546, when the silver mines of Potosi were discovered. Between the discovery of America and the opening of these mines, the total amount of gold and silver brought to Europe is estimated by the same authority at not more than £17,000,000. During the century ending 1699, the mines of Europe and America are supposed to have yielded £337,000,000 of gold and silver, chiefly the latter. If we trace the effects of this influx on the precious metals on the prices, we find that the advance in the price of wheat, during this century, appears, by the Oxford tables, to have been from 27s., the average of twenty years at its commencement, to 36s., the average of twenty years at its close. As far as this can be relied on, as a criterion of prices, it would appear that this large increase in the production of gold and silver only raised them about 33 per cent. During the 18th century the average yield of the precious metals may be considered to have been doubled. At the commencement of the present century it had reached its highest point in 1810, after which it fell off in consequence of the anarchy which prevailed in the Spanish colonies on their separation from the mother country; and the suspension of mining operations which it produced. In 1806 Humboldt estimated the total annual yield of gold and silver from Europe, America, and the Russian dominions in Asia, at £10,755,000. For the century ending 1799 it might be estimated at £800,000,000, or eight millions annually on an average. In tracing the effect of this increase on the prices of commodities, those years must be excluded which succeeded the suspension of cash payments by the Bank of England, and the issue of inconvertible paper. Deducing the average price of wheat from the mean of the Oxford and Eton tables, and comparing the average of thirty years ending 1695, with the average of thirty years ending 1795, we have an advance from £1 18s. 5d. the quarter to £2 10s. 3d. The increase is rather less than 31 per cent. The accounts of Greenwich Hospital show an advance of about 20 per cent. on bread, meat, and butter, between 1730 and 1791.

A review of the produce of the precious metals

during the 16th, 17th, and 18th centuries, and its influence on prices, would give then, from these data, results which may be thus expressed in a tabular form :—

Centuries.	Produce of Gold and Silver.	Increase of prices.
16th	138,000,000	300 per cent.
17th	337,000,000	33 ,,
18th	800,000,000	20 to 30 ,,

Why this difference? Why should the smaller sum raised during the 16th century produce so much greater effect than the larger sums of the 17th and 18th centuries? There were several causes in operation. In the first place, the smaller produce of the 16th century bore a larger proportion to the then existing stock of the precious metals, reduced, as before stated, to about 35 millions, than the larger produce of subsequent centuries bore to the stock in existence during those centuries.

In the next place, there had been a great and progressive increase in the productions of those commodities which are exchanged for one another through the medium of the precious metals; this increase requiring a corresponding increase in the quantity of the medium of exchange.

Lastly, there had been an increase equally great in the consumption of the precious metals for the manufacture of articles of ornament and luxury. With respect to the increase of material wealth, we know that the rise of prices consequent on the discovery of America gave a great stimulus to production, though we have no means of forming an accurate estimate of the rate of increase, or of the increase of population during the 16th and 17th centuries. Both, however, must have been considerable, and must have had a great influence in counteracting the advance of prices which would have taken place had the medium of exchange increased, and the amount of commodities to be exchanged remained unaltered. The great and rapid development of commerce, manufactures, and agriculture, and the increase of population during the 18th century, and particularly soon after the accession of George the Third, is matter of such general notoriety that it is needless to attempt to prove them by reference to the more full and accurate statistical details which exist for that century.

With regard, again, to increased consumption of gold and silver in the arts, it is wholly of modern growth. It dates from the reign of Anne. The greater portion of the old plate in the possession of the nobility and public bodies belongs to that period. The introduction of tea, which then took place, and its continually increasing consumption, originated a great demand for silver spoons, which were scarcely known in the preceding reign. This demand received a fresh impetus at the commencement of George the Third's reign. Silver spoons were then made heavier than before, the use of silver forks was introduced; silver was employed in the manufacture of tea urns, tea pots, coffee pots, and salvers; and the use of such costly luxuries extended to lower grades of society. The use of watches became much more general, and the manufacture of copper plated with silver formed a new and extensive branch of industry in London, Sheffield, and Birmingham. The consumption of gold in gilding increased with equal rapidity. The number of goldbeaters was tripled in twenty years. At this time also commenced the practice of gilding silver articles, and of applying gilding to the decoration of the interior of public and private edifices. The manufacture of porcelain also began to consume large quantities of gold, which becomes totally lost by the fracture of the articles in the gilding of which it is used. From the combination of all these causes, the increase of population, and material wealth, and the increased consumption of gold and silver in the arts, we have a satisfactory explanation of the fact that prices only advanced from twenty to thirty per cent, while the metallic wealth of the world increased more than cent per cent.

If the gold and silver mines of the world doubled their produce during the seventeenth century, and again during the eighteenth, without raising prices in either case more than 20 or 30 per cent., it is not unreasonable to suppose that the produce of the precious metals may again be doubled during the nineteenth century without any greater change. The same causes which prevented a greater advance then are in operation now, and are acting with increased intensity—increased population, increased production of commodities in general, increased consumption of the precious metals for other purposes than those of coin. Population is doubling itself in Britain every forty years. Should emigration render it stationary here, of which there appears every probability, the increase will be transferred to new countries, where it will be still more rapid. Our mills, and forges, and workshops, pour forth their wares more rapidly than ever: their powers of production so much exceed the demand, that it is often necessary to limit the supply, by suspending operations till the glut subsides. The cheapness produced by over-supply causes increased demand, which stimulates production, and again causes a glut. The average result of these fluctuations is a general increase of production. Consumption in the home market increases, our imports increase, our exports increase, and at the same time foreign countries are producing the same commodities in increasing quantities for themselves. Articles which two centuries ago were rare luxuries in the mansions of nobles and the palaces of kings, are to be seen at the present day in most of our cottages. Silk stockings, which James the First borrowed of one of his courtiers, when he wished to be particularly spruce, and which Elizabeth received as a present worthy of a monarch's acceptance, are worn on Sundays, in the reign of Victoria, by every factory-girl in the manufacturing districts. The complexions of our maid-servants are defended by silk parasols, and we have even seen them borne in procession by charity-school girls on their way to church. In agriculture increased production is not so rapid, nor so great, as in manufactures; but it is still progressive. We have scarcely any commons to inclose, so many were brought into cultiva-

tion in the reign of George the Third: but improved modes of cultivation are taking place daily, and never so extensively as during the last ten years, which are adding in effect to the area of these isles by the increased produce which they cause. These improvements are not effected so rapidly as they might be. If they were, we should not have consumed so much imported corn during the last five years—for all that has been imported has been consumed, in addition to an increased growth at home. If all the improvements of which agriculture is susceptible were suddenly applied, they would add more to the produce of the soil both of corn and cattle, and would cause a greater reduction of price, than has yet resulted, or is likely to result, from free-trade. The demand for the precious metals in the arts is greater than ever, and is rapidly increasing; the use of watches and trinkets is descending year by year lower in the scale of society. The greatest consumption of gold is not in the fabrication of utensils and ornaments for the use of the wealthy; but in the manufacture of cheap jewellery, containing individually little gold, but collectively much, from being adapted to the means of purchase possessed by the millions.

The advance in the price of agricultural produce, which might benefit the farmers if it took place speedily, would lose much of its value as a means of relief from their present difficulties if spread over twenty years. It would be of no value at all if diffused over a century Let us see, therefore, what prospect there is of such an advance in consequence of the gold yielded by California and Australia. For the purpose of such an inquiry, we must revert to the history of the production of the precious metals from the commencement of the nineteenth century. Up to that period there had been a constant and gradual increase till 1810. The total annual yield of gold and silver from Europe, America, and Russian Asia was estimated by Humboldt at £10,750,000 in 1806. After 1810 it began to decline, from causes which have been mentioned. From 1810 to 1830 it was not more than £5,000,000 annually, which is about one million less than the annual consumption in the arts, to say nothing of the wear and other losses on the existing stock, estimated by M'Culloch at 1 per cent. per annum. By 1840 the reviving produce of the silver mines of Mexico and Peru, improved processes for extracting the silver contained in most lead ores, together with the gold obtained from the Ural and Siberia, had again raised the produce to about its amount before the falling off of the American mines after 1810.

Wyld estimates the total yield of gold and silver for the following years, as increased by the Californian and Australian discoveries, thus—

1840.....	£11,750,000	of gold and silver.
1848.....	13,750,000	ditto
1850.....	25,000,000	ditto
1851.....	30,000,000	ditto

Taking the average produce from 1800 to 1810 at eleven millions sterling, from 1810 to 1830 at five millions, 1830 to 1840 at eight millions, 1840 to 1848 at twelve millions, 1849 fourteen millions, 1850 twenty-five millions, and 1851 thirty millions, we shall have an aggregate of 455 millions, instead of 612 millions, which would have been the amount with a steady yield of twelve millions annually through the whole fifty-one years. The present extraordinary yield, therefore, of thirty millions annually will be required for five years more, in order to make up the deficiency.

According to the analogy, however, of the seventeenth and eighteenth centuries the produce should be double that of the preceding century, and prices should advance from 20 to 30 per cent. during the nineteenth century. If we suppose half the increased produce and half the advanced price to take place during the first fifty years of the century, we ought now to have raised, not 455 millions nor 612 millions, but 800 millions; and prices ought to have advanced 15 per cent. on the metallic prices of the latter part of the 18th century. The average price of the quarter of wheat for the 30 years ending 1795, before it was affected by the Bank Restriction Act, was, as we have already shown, £2 10s. 3d.; an advance of 15 per cent. on that price would give £2 17s. 9d. as the present price of wheat. That price has certainly not been realized by the farmers of late, any more than 800 millions of gold and silver have been raised from the mines. The produce of gold and silver, again, during the 19th century ought, according to the analogy of the two which preceded it, to amount to 1,600 millions, or double that of the last century; and prices ought to advance, say 30 per cent. during the century. In that case we should have £3 5s. 3d. as the average price of wheat forty-nine years hence; and if for those forty-nine years the produce of the precious metals should continue at the present enormous yield of 30 millions annually, it would only give, with the 445 millions already raised, 1,915 millions for the century, or 315 millions more than would be required to raise prices generally, as far as gold and silver are concerned, to 30 per cent., and to bring the average price of wheat up to 65s. 3d. per qr.

Whether the present produce of gold will continue for the next fifty years is a geological question which will be discussed hereafter. Its effects, however, should it continue, would be so distant as to afford no relief to the present race of farmers, and their utmost extent would not amount to that revolution in the value of property so much dreaded by some, and hoped for by others. It would not be such as to justify an alteration of the standard for the benefit of annuitants, and creditors, by the substitution of a silver standard, or a double standard of gold and silver, or by increasing the quantity of gold in the sovereign. Australia and California furnish no excuse for maintaining protection rents under free trade; neither do they furnish a sufficient excuse for the abandonment of protection by statesmen who have declared that British agriculture cannot exist without it.

T.

THE SCIENCE OF MANURING.

BY T. ROWLANDSON, C.E., F.G.S.

CHAP. VII.—MANURING WITH MINERAL SUBSTANCES.

The above title is applied to such substances as chalks, marls, gypsum, &c.; in the course of the following remarks the term will be used in its ordinary acceptation.

The use of mineral substances as manure is very ancient; for Pliny, in the quaint language of his translator Holland, observes, "And whereas some great husbands there be, that teach us to enrich and mend one ground with another, to wit, by spreading fat earth upon a lean and hungry soil, and likewise by casting dry, light, and thirsty mould upon that which is moist and over fat." Of this practice, however, Pliny does not appear to approve, for he calls it "a mere folly and wasteful expense both of time and travail; for what fruit can be ever looked for, to reap from such a mingle mangle of ground." Subsequent experience has, however, proved that in thus condemning the practice of using mineral subs'ances as manures the celebrated historian was wrong. Mineral dressings are generally applied to the soil with only two objects, viz., either of altering the mechanical condition of the soil, or else with the object of applying some calcareous substances supposed to be present in the mineral employed. It must be evident to the commonest capacity that where the object is to give consistency and firmness to light soils, such as sands and peats, this will be best obtained by using a clay containing a large amount of alumina, in fact the stiffest clay. When the converse of this is wanted, viz., the rendering stiff soils more porous, sharp siliceous sand or peat will be found best adapted for the purpose. It is, however, extremely rare that cases occur where either of these processes is carried to such an extent as to materially change the physical condition of the soil; to do so would usually entail such an expense as the beneficial results derived therefrom will rarely justify. This must be obvious to any one who is in the slightest degree aware of the labour involved in changing the mechanical condition of an acre of light sand or the reverse, even if the requisite dressing is within a few feet of the surface, but beyond the reach of the plough.

Mineral substances are, however, more frequently applied as a source of manuring the land rather than for altering its texture, though the latter is often an important object; when this is the case, in the great majority of instances the mineral substance so employed is used solely on account of the calcareous substances it is supposed to contain, when its action will be precisely the same as chalk, or effete lime, which is only another term for quicklime when converted into the carbonate of lime or chalk. Where a great change in the mechanical condition of the soil is not an object, the only advantage of using marl instead of lime will be where the latter is difficult to be procured and at high prices: in such instances the use of marl may be unobjectionable. When marl is used for its calcareous matters, the farmer using it ought to ascertain the proportions contained in it; for nothing in the form of manure is so variable, marls sometimes containing only five per cent. of carbonate of lime, sometimes fifty per cent. or upwards of that substance. The chemical action of marl on the soil is the same, only not so immediate, and less intense than that of quicklime; at equal cost marl is to be preferred to lime for cultivating peaty grounds or soils containing much vegetable matter.

Chalk being carbonate of lime, all that can be said respecting it would be merely a repetition of what has been stated respecting lime.

Gypsum. On referring to the tables of the mineral constituents of plants, it will be seen that sulphuric acid, and sometimes sulphate of lime, form not inconsiderable items in the total amount of the inorganic constituents. It is obvious, therefore, that gypsum forms a necessary constituent in all fertile soils; it is presumed that it also acts as a fertilizer indirectly in the following manner: it has been distinctly proved by carefully conducted analyses that rain water invariably contains an appreciable but exceedingly minute quantity of ammonia, supposed to exist in the form of a carbonate this ammonia is supposed to be fixed in the soil by the gypsum present, thus converting the carbonate of ammonia, a soluble substance, into sulphate of ammonia, which is not volatile, and the sulphate of lime (gypsum) into chalk (carbonate of lime). There are good reasons for believing that this takes place to some extent. In consequence of this property it has frequently been recommended to strew stables with this substance (gypsum), and also to throw it in layers over manure heaps; in these latter instances it is, however, only partially successful: as gypsum acts usefully when applied to the soil, the practice is not altogether unprofitable.

Alumina, which forms the plastic principle of clay, has the property of solidifying ammonia to a slight extent. This property is also possessed by peroxide of iron. It will be generally seen that fertile soils contain a considerable percentage of one or both these substances.

The theory that fertility is induced only when the mineral constituents of plants are present in an available form, together with a nitrogenized substance, has been fully confirmed by the observations of Messrs. Paine and Way (Journal of the Royal Agricultural Society of England), on the phosphoric strata of the chalk formation. They state that wherever it outcrops, the soil is distinguished for its fertility. "The prolific crops of wheat, beans, and clover, which are grown with the aid of a comparatively small quantity of manure, evince its productive capabilities. The application of bones has usually failed in producing any apparent benefit. It has very generally been experienced that manures richly charged with nitrogenous matter have proved signally useful in this class of soils. It has been generally observed that, in wet summers, the growth of the bine of the hop on these outcrops is too luxuriant, and consequently injurious to the crop, which invariably ripens later on these spots. In consequence of the excess of food, the same effects occur when a field has been too highly manured. In dry summers, on the contrary, the crops are unusually and conspicuously large. The influence of this marl upon the corn has been equally conspicuous, the wheat crops especially having always exhibited a far more vigourous growth than usual upon the outcrops. There is a very striking illustration of the effect produced by a narrow band of the green marl, which runs through a field of wheat at north east extremity of the parish. The strata here are nearly vertical, and the band is very thin, so that its direction across the field may be traced by a dark green luxuriant belt of wheat, about six feet in width. An arable field, in which the green marl is widely developed near the surface, is remarkable for its natural fertility, and has received manure only thrice in thirty years, viz., rags, bones, and guano. Not the slightest good resulted from the bone manure, although forty bushels per acre were put on." They also state, "that an old quarry, from which at some remote period thousands of loads have been removed, has recently been reopened by the present proprietor, in consequence of his having carted a few loads, by way of experiment, upon some adjacent pasture land, where the benefit arising from its application was most perceptible, especially in developing a good herbage of clover. A small quantity was also taken to another part of the estate, about a mile distant, and was put upon an arable field, but in this case no advantage accrued. A recent examination of this field demonstrated the cause of the failure by indicating the presence of the identical phosphoric band in the subsoil, immediately below the spot where the marl was applied. The proprietor also mentioned a circumstance which occurred twenty-years ago, when some of the marl from the pit alluded to was carted away to a neighbouring farm. The waggon once broke down, and its contents were thrown upon an adjoining field, and spread very thickly over a small space. The spot was noticed during many successive years, on account of the superiority of the crops which grew there; yet strange to say the evidence was practically disregarded. The marl contained of the under-mentioned substances the following per centages respectively, viz.,

Carbonate of lime	25.72
Phosphate of lime	14.92
Potash	2.69
Soda	0.50"

Seeing that there is so much potash and phosphoric acid present, there can be no wonder at the great fertility of a soil so constituted. These phosphoric marls form an exception to the ordinary class of marls, and are only found in the Chalk and Norfolk crag. From Pliny's description of some of the marls in Britain, it would appear that these phosphoric marls were known to the Romans when in possession of Britain.

On one point, however, it is pretty conclusive that the practical use of marls was better understood in Britain at the time of Pliny than it is generally at the present moment, for he maintains that an application of marl was always considered to last 80 years, and that it was never known for a man to marl his land twice in the course of a lifetime. This apparently sparing application of marl can only have arrisen from carefully made observation on its practical effects, and not from want of appreciation of its virtues; for he says: "The Britons and Gauls have devised another means to manure their ground, by a kind of limestone or clay, which they call marga (*i. e.* marl), and verily they have a very great opinion of the same, that it mightily enricheth it, and maketh it more plentiful also. These marls (all the kinds of them) do greatly enrich Gaul and Britain both, and therefore it would not be amiss to speak of them more exactly; in old times there were two sorts thereof and no more, but of late days (as man's wits are inventive every day of one thing or other) several kinds have been used." On the main point, however, viz., the too frequent and unnecessary use of marl, we appear to have retrograded from the wisdom of our ancestors, which wisdom, though possibly only founded on observation, is, notwithstanding, scien-

tifically correct, which has been fully explained when treating on lime.

FALLOWING AND BURNING OF LAND FOR MANURE.

Although apparently unconnected with the subject of manures, some notion of fallowing is requisite, not only because the theory of its action is intimately connected with and throws considerable light on the subject of manuring, but also because aration is frequently substituted in place of applying manures. Land may, however, require fallowing entirely irrespective of any advantage which may be derived from the operation, other than that of cleansing the soil from weeds; we shall not dwell upon this part of the subject, because it is well known that when once land has become foul there is no other mode of extirpating the rubbish than that of repeatedly ploughing, harrowing, scuffling, and either carting off the weeds, or collecting them in heaps and burning them, the latter being the better method, as at the same time some of the soil may be burnt with them.

At present, however, we have only to treat upon that branch of fallowing which is adopted, not with the object of removing weeds, but for the purpose of restoring an exhausted soil to its original state of fertility. It has already been shown, from the experiments of Dr. Daubeny, at the Botanic Gardens at Oxford, that a very large amount of the mineral constituents of plants exists in the soil in what is termed a dormant state, or incapable of being converted into soluble forms, other than by the long continued action of moisture and carbonic acid. The different operations of fallowing cause those parts of the soil which are moved to present fresh surfaces to the sun and atmosphere, and by breaking and cracking the clods into innumerable small pieces greatly multiply the surfaces presented to the atmosphere. The decaying vegetable substances in the soil gradually absorbs oxygen from the atmosphere, and become converted into carbonic acid, which, with the assistance of moisture, slowly liberates the alkalies and phosphates from the minerals in which they had previously been held in combination in an insoluble form; in this way, on some soils it is found that the fertility has been sufficiently renewed to produce a profitable crop. Experience has shown that fallowing, excepting as a cleaning operation, is only beneficial in soils containing the mineral constituents of crops in a dormant state, such as clays, marls, and loams. On peats and sands fallowing is useless, and generally the same remark may be made respecting chalks. On stiff clay, there can be no doubt that some of the benefits derived from fallowing is to be attributed to the mechanical division into which the clods are broken during the process. Every soil which is capable of yielding an abundant crop of any kind of plants after fallowing, must be presumed to possess within itself all the mineral ingredients necessary for their growth; when fallowing is sufficient to set these ingredients at liberty, sometimes that operation may be most convenient and profitable: in other cases the mineral substances in the soil may not be so tractable; in such instances burning the soil may be found advantageous.

When a chemist has to analyze a mineral that is refractory, in other words, of difficult solubility by the ordinary agent, it is a common practice to submit such mineral or other matter to the agency of heat, which, sometimes wholly, but generally partially, has the desired effect; the remaining intractable matter, or the whole substance if found unchanged after torrefaction, is mixed with some alkali, as lime, soda, or potash, and again submitted to fire, on withdrawal from which, the constitution of the matter under investigation will generally be found so changed as to be soluble in the ordinary solvents. It is, however, necessary to be borne in mind that the total solution of aluminous and siliceous soils can only be obtained by treating them with an excess of alkali. An amount of alkali necessary for this purpose is never found in soils, and the process is only here mentioned to show the rationale of the action which takes place during the process of burning land for manure.

From the preceding observations the reader will be prepared for the information that the object of burning land for manure will be found most beneficial on those soils which contain the largest amount of the inorganic constituents of crops in a dormant form, but which the agency of heat will convert into an active one. As in fallowing, the greatest benefit from burning may be anticipated on such soils as clays, marls, and loams, lessening in degree as they become more composed of siliceous, calcareous, or peaty substances: in fact, on some of these, such as poor sandy and gravelly soils, burning is utterly ruinous. As a theory, respecting the character of soil on which burning is either beneficial or disadvantageous, the rule just set forth may be pretty safely relied upon; there are, however, many circumstances which act as drawbacks to its general application, arising from the fact that soils variously situated may be found of equal tenacity, but at the same time of exceedingly diversified composition, and requiring varied methods of burning. These different circumstances arise from the fact that soils taken from different places may to all outward appearance present the same mechanical tenacity, whilst their mineral constituents may be in a different state of mechanical division, in varied proportions, or of altered chemical character; so

infinite are their varieties that it is impossible to describe all these different qualities.

Two great difficulties attend the burning of stiff soils, the one arising from the heat engendered being sometimes so great as to bake instead of disintegrating the minerals composing them; the other occurs when the heat is not sufficiently intense to change the inorganic constituents of plants contained in the soil from a dormant condition to an active state. The first difficulty arises from permitting too great a draught, consequently causing a rapid and often a partial combustion. The second difficulty occurs when the heaps or kilns are formed either too close, or too open: in the former case, the too free access of air occasions the fires to burn languidly, and at a low temperature, owing to the absence of a sufficiently powerful draught; on the other hand, if the clay or sods are packed too closely, and thus partially excluding the air, it has the effect of retarding combustion, and promoting the attainment of the required degree of heat, so much so that in some cases combustion is stopped.

As soils vary so much in respect to their capacity for burning for manure, it may be supposed that rules cannot be laid down for every case; in fact, unless a farmer knows from experience the proper mode of forming heaps for burning, adapted to his particular soil, it will be much better for him to make a few experiments on a small scale, rather than depend upon any written or oral instruction. If, in the course of these experiments he can enlist the aid of a neighbour or labourer acquainted with the art, it will greatly assist him; notwithstanding such assistance, considerable practice will be required before he becomes a proficient, as injurious effects frequently arise from apparently trivial causes; as an instance, it may be mentioned that whilst in calm weather heaps should be made as open as is consistent with the maintenance of a proper draught, in windy weather they ought to be made as close and as large as possible, and care taken that every hole and crevice is stopped up, particularly on the leeward side; for this purpose it is well to always leave a few sods unheaped. If the soil yields to the agency of a slight torrefaction, in consequence of its composition being such as not to have a tendency to bake, or the large amount of carbonaceous matters which are present, it may be necessary to throw on the lee-side some shovelsful of earth. In this way, on fine open loams, the farmer may burn double or treble the amount of soil that he would otherwise have been able to do.

In arranging heaps for burning, both as respects size and situation, it may be observed that with stiff clays, particularly such as contain only a small amount of vegetable matter, it will be found almost impossible to obtain the requisite heat in small heaps; whilst on free open soils, or such as contain a considerable quantity of carbonaceous matter, the heaps or stubbles—other circumstances being favourable—can scarcely be too numerous, as every heap burned on soils of the latter quality will sometimes torrefy or char the soil on which it is placed to a depth of 2, 3, 4, and 5 inches, thus greatly increasing the amount of torrefied soil and ashes, without any increase, but rather with a diminution of labour and expense. In dry weather when all the principal sods &c. are gathered up and placed in heaps, it is a good practice to send men round with rakes, for the purpose of raking up every particle of grass, weeds, &c., and small clods of soil into small heaps, and to throw a shovel-full of fire on them; in favourable weather this mode will be found to increase the amount of soil burnt very much; the rakes for this purpose should have their teeth formed of nails, inserted into an ash head about 2 feet 6 inches long, and 1½ inches square.

Soils that are very stiff, and do not contain much vegetable matter, require great attention in forming heaps, so that they will burn thoroughly, without too great or two small an amount of heat.

One of the principal rules to be observed is, to always erect the sods endwise, only the three or four sods placed in the centre having their grassy surfaces presented to each other, every succeeding row being placed with the turf side next to the earthy side of the preceding row, the whole to be set up in as compact a manner as possible. The heap being erected of a dome shape, fire must be applied at the top, over which a sod ought to be placed. Any clay with a moderate degree of sward will thus, if carefully attended to, produce a quantity of ashes adequate to the maintenance of a crop. It may, and often does occur with clay soils, which would be much benefited by burning, that little sward is found, or if attempted after a cereal crop scarcely any; the vegetable matter principally consisting of weeds, and grasses that partake of the character of weeds, their utter destruction forming as prominent an object with the farmer as the production of ashes. When this occurs, the best plan to be pursued is to burn the whole in a clamp or kiln; for if it be attempted to burn the soil by the mode previously described, only a very small amount of ashes will be obtained, and the entire destruction of the weeds will be jeopardised: the clots of clay being so divided that it is almost impossible to construct a heap in the ordinary manner, that will at the same time burn the clay and consume the whole of the vegetable rubbish; in these cases clamps or kilns will be found the most commodious mode of burning the soil, and at the same time

eradicating the weeds and surplus vegetable matter by combustion.

Burning in clamps or large heaps requires to be managed by practised hands, for its due management can only be learned by actually operating on any given kind of soil.

In illustration of this position the following examples may be cited: Mr. Pym states, Royal Agricultural Society's Journal vol. 3.—"The great art is to let the clay burn slowly, which depends very much on the proper formation of the walls, which are of turf, as the ashes then turn black for the most part, and are considered much better than when they are red or clinking like bricks." Again Mr. Pusey gives in the same volume, on the authority of another correspondent—"The heat should always be slow and steady; never, if possible, burning the clay red, though this is very difficult indeed to manage, depending very much on the wind, and it is but effected by making heaps of not less than 60 or 100 loads each, and these will take from two to three months to burn. All inexperienced hands use too much fuel, get their fires too fierce, lay their stuff too hollow, make a great deal of smoke—whereas, the less they make the better—get their heaps to a red heat, and burn them through in a week or ten days; the consequence is, that when their heaps are opened, instead of ashes, or lumps that will fall into ashes by exposure to the air, out roll knobs as hard and as useless as brick-ends." "Much also depends upon the size of the clay lumps, and their state of humidity; if too dry they will burn too fiercely, if too wet they will not burn at all." Other writers have found exposure of clay clods to the atmosphere advantageous; in contrast with the above, Mr. Long states, in allusion to this subject, that on his soil—a thin dry flinty loam upon chalk—that, "the only difficulty being, that many persons, himself amongst the number, at first produced a hard substance, more resembling a brickbat than powder." (Journal of the Royal Agr. Soc., vol. vii.) This difficulty he obviated by well saturating the soil with water (previous to burning), working and treading it to the consistency of mortar; for, adds Mr. Long, "water will separate any particle, however adhesive; and then the fire, expelling the water and the carbonic acid gas, leaves the particles previously separated, when burned, in the state of a very fine powder, and if any should not be at first quite separated, it slacks immediately on the application of liquid." The reader will here perceive what very opposite conclusions have been arrived at by two parties acting on different soils. With respect to clay burning into clinkers, there can be only one opinion, viz., the utter worthlessness of the process if conducted so far; but if the process is not carried further than merely to char the vegetable matter in the clay, and thus merely form black ashes, such ashes will be found of little service as a manure, as they will only contain the inorganic constituents of the charred vegetable substances in the clay, with probably a slight amelioration of the mechanical condition of the soil, thus rendering a stiffish soil somewhat more porous, and consequently permitting a freer access of the atmosphere to the roots of plants; it may, however, with safety be averred that any mode of burning clay for manure which stops short of converting the protoxide of iron (black oxide) into the red or peroxide is incomplete, and will not produce any strikingly beneficial results.

In the instance recited by Mr. Long, it would appear that his soil consisted of decayed minerals and flints in the state of ruble, but not intimately blended together; in which case the theory of the action of the water, and mixing the soil into mortar, becomes explicable in the following manner, viz., when burned without mixing, the finer particles of the soil are apt to be acted on by the fire; but when coarser matters become intimately mixed with the finer parts of the clay, the fire is not sufficiently strong to vitrify the coarser parts, although hot enough to flux them when finely divided; otherwise Mr Long's experiments would be in opposition to the practice of brick, tile, &c., manufacturers, who water and tread their clays for the express purpose of causing them to bake into a firm mass.

Marls that contain a moderate amount of vegetable matter, and a considerable quantity of lime, will be found when placed in the ordinarily formed heaps to burn easily in moderately dry weather; if, however, the marl should be of a tough, blue character, which is so frequently found as a subsoil, and also in a great measure destitute of vegetable substances, it will be found impossible to burn it advantageously, other than in kilns or clamps, and to effect it by the latter process it will be frequently found requisite to use small coal, furze, &c. The description of marl just noticed will generally be found that best adapted to burn for manure, but great caution is required in conducting the operation; should it, however, get over burned, it will generally crumble into powder on throwing water over the lumps, in consequence of the calcareous matters present.

In proportion as soils proceed from stiff clays and marls to light sandy soils, will the benefits arising from burning be found to diminish. A stiff soil is properly burned when the ashes are obtained of a red colour (if oxide of iron is present), and in small rounded lumps that easily crumble into a fine powder when pressed between the fingers, at the same time possessing a gritty feel.

Deep vegetable soils, as bogs and peat mosses,

are greatly benefited by paring and burning, for which purpose the land should be pared by the breast or the push plough, Dutch plough, or skim, and subsequently cross cut and torn about with a harrow, or cultivator, and afterwards drawn into heaps by horse-rakes.

In burning land for manure it must always be remembered that on whatever description of soil it may be practised, infertility will soon follow unless the farmer returns to the soil an equivalent of manure for the crops taken from it. Taking crops after burning, without returning such equivalent, are merely drafts on what should be the resources of future years. It is the practice of farmers taking crops from burned soils, without replacing the ingredients carried away in those crops, that has brought the method into disrepute.

There are few practices in husbandry more advantageous as an assistant to the fallow season than that of burning land on all descriptions of soils, except sands and gravels. On downs it has been found advantageous, and particularly so on chalks which have been some years previously under sainfoin; the latter fact might have been anticipated, as sainfoin sends its long roots many feet below the surface, insinuating themselves between the interstices of the chalk, drawing thence a supply of inorganic constituents not otherwise attainable, but which are in a great measure yielded to the surface-soil, when the roots &c. torn up during cultivation are burned; this last-named circumstance is a parallel instance with what has been previously related of clover.

Provided an adequate return is made to the soil of the inorganic constituents of the crops taken away after burning, no injury will be sustained by it.

CONCLUDING REMARKS.

In the preceding pages it has been my endeavour to epitomise all that science has pointed out respecting the growth and nutrition of plants, and to popularise the same as much as possible, in order to bring the various subjects within the comprehension of the ordinary farmer. Before, however, taking an entire leave of the matter, it will be well to notice some important and recently published observations that have been made by others, some of which corroborate the views I have detailed, and at the same time are calculated to attract our attention to new courses of procedure; in the latter allusion, I point more particularly to the important observations of Professor Way, respecting "The Absorptive Powers of Soils." Before, however, entering upon these topics, I shall take the liberty of making a short *resumé* of a few of the principal features which I have touched upon in connexion with the economising, and production of fertilising agents, and also as regards a matter which now occupies much attention, namely—whether a cheaper substitute than guano can be obtained as sold at its present price.

Most of the general views which I have put forth on the various questions respecting manuring have been from time to time laid before the public in one or other of the various agricultural publications during the last ten years. It is some gratification to find that many of the views which I originally set forth, have received either the tacit or direct admission of some of the most influential and practical chemists and agriculturists of the day, of which I shall shortly make a brief notice.

Dr. Anderson, Chemist to the Highland Society, in a lecture delivered before its members, has pursued the same line of argument which I have adopted, respecting having coverings to manure-steads. In the last part of the Journal of the Royal Agricultural Society of England will be found some valuable suggestions and a description of the advantages derived from its adoption in Cumberland (see the able report of the Agriculture of Cumberland by Mr. Dickson).

From all that I can learn, it is highly probable that the covering of manure heaps will become a general rule within a short period, in place of being as at present the exception.

On another subject which, on a stiff land, is of no little importance—it is satisfactory to know that my views on the cause of the efficacy of burning land for manure have been further established by the experiments of Professor Voelker, who has shown that the effect produced by burning soils is to render the potash, &c., more soluble. The mechanical division of the soil caused by judicious burning is, however, one also of great influence in producing fertility, and ought never to be overlooked. The experiments of Professor Way, on "The Absorptive Powers of Soils," have satisfactorily shown that burned clay loses the property of absorbing ammonia from the atmosphere; which most unburned clays are found, by experiment, to possess in a greater or less degree. Now, as on many soils, especially friable loams, the fertility following the operation of burning cannot be referred to the alteration of mechanical mixture, nor to increased power of obtaining ammonia, the latter being in fact decreased, no other inference can be drawn than that in such cases the improved fertility of soils after burning arises from the greater solubility of potash previously existing in insoluble forms.

A better opportunity will perhaps not occur than the present, to make some observations respecting what has been stated by Professor Way, regarding the exhaustion of soils by taking successive crops. Mr. Way observes, "There was no doubt that the

continuous cropping by wheat or any other plant, without the return of anything in the shape of manure, would gradually, but certainly, reduce the quantity of mineral matter contained in the soil; but the quantities so removed are now accurately known, and it would be found that a continuous course of cropping by wheat for many years took from the land only a very insignificant quantity of these substances. The following table shows the amount of phosphoric acid, potash, &c., removed by a large crop of wheat, in one year and twenty years, and in another column of the table, the *per centage* composition which the soil must have to yield them for twenty such crops."

"35 Bushels of Wheat, and 2 Tons of Straw.

	1 crop.	20 crops.	Per centage removed from soil
	lbs.	lbs.	by 20 crops.
Silica.....	171	3,420	0.152
Phosp. acid ..	30	600	0.027
Sulph. acid ..	8	160	0.007
Lime	16	320	0.014
Magnesia	10	200	0.009
Potash	39	780	0.036
Soda.....	3	60	0.003
	277	5,540	0.248

The per centage removed from the soil by 20 crops, is calculated on the assumption that the soil is 10 inches deep, and weighs 1000 tons."

"Those who had anything to do with the analyses of soils would see (observes Professor Way) that no soil of ordinary fertility would be found without a small quantity of these minerals—indeed, it is usually the case that a loamy soil contains from two-tenths and upwards of potash and other substances in proportion; and although the whole of this might not be available at any one time, the constant stirring of the land brings them into action, furnishing a constant supply adequate to the wants of plants." Practically, however, it is well known that aration does not so rapidly bring into action the inorganic constituents of plants, for if a field was manured with 100 tons of pounded granite, containing 9 per cent. of potash, thus forming a soil having 0.9 per cent. of potash, it would be years before atmospheric and other influences would bring that amount of potash into available use to crops. There may also fairly exist some doubt whether the roots of plants are so disseminated as to absorb from the entire soil of a field, the whole of the mineral ingredients then in a soluble form, even if existing somewhat more in quantity than would be required by the greatest imaginable produce. Again, ought wheat to be taken as the standard? Turnips and other green crops commonly exhaust the soil to a greater extent than cereal crops, more especially of potash, which, from its commercial scarcity, may be considered the most valuable of all the elements entering into the composition of a good manure. Now, a crop of 20 tons of swedes contains 140 lbs. of potash, and 20 successive crops would, if carried off the field, abstract 2,800 lbs. of potash, or nearly one ton and a quarter, or 0.130 per cent. of the soil calculated ten inches deep.

Few soils are cultivated to a depth of 10 inches, as is well known to all practical farmers. From these reasons, it is therefore evident, that on the general run of soils, the mineral fertilisers may be, to all practical purposes, somewhat rapidly abstracted. Whatever tillage may do towards assisting in the absorption of ammonia from the atmosphere and rain—and on this point I go the whole length with Professor Way—it is quite evident that such absorption, by increasing the temporary fertility, owing to the greater power of plants in absorbing its mineral constituents, must ultimately result in a more rapid exhaustion, terminating for practical purposes in barrenness, unless the abstracted minerals are restored to the soil.

The above somewhat lengthened remarks have been made, owing to the great attention which has recently been called to "the Tullian" system of husbandry, by the experiments of Mr. Smith and Professor Way's lectures. That the latter gentleman has, in a great measure, if not wholly, explained the rationale of the effects which manifestly follows the adoption of a constant system of tillage on alternate spaces, I fully believe; and the agricultural world is indebted also to that gentleman's investigations on the subject for an important principle which will probably in a few years entirely revolutionise our ideas respecting manuring, and may ultimately render us less dependent on Peru for guano, as an agent for supplying ammonia to the soil. I allude to the action of the hydrated double silicates of alumina and lime, magnesia, &c. This subject is, however, too important to be treated upon at the tail-end of a series. In conclusion, however, I venture to predict that at a period more or less early, accordingly as farmers and landlords become alive to the importance of the subject, these double silicates will become a branch of manufacture on as extended a scale as those connected with any of our largest metallurgic or chemical establishments.

Whilst the above was passing through the press, my attention was drawn to a very complimentary article by Mr. Towers, in the *Journal of Agriculture*, in which that gentleman verifies from actual experience the soundness of the opinions given in my article on lime, which appeared in the last number of the *Farmers' Magazine*. I mention this circumstance because "lime," up to the

present period, has been overlooked in this *resumé*. With me it is a matter of doubt whether farmers generally are most out of pocket in their annual outlay by one of three things—"the misapplication of lime and calcareous substances," "the sale of spurious and adulterated manures," or the "extra cost of guano as compared to what it might be obtained, if the landowners and farmers of England combined to form at a cheaper rate at home that which they now pay so dearly to import." Assuming the consumption of guano at 150,000 tons annually, and that the consumers pay £2 per ton beyond the price at which an equal article could be produced at home, it is evident that they are self-taxed to the extent of £300,000 per annum on this item alone. Add a like sum for each of the other items, and we have a grand total approaching a million per annum. By adhering to the rules laid down in the chapter on lime, any farmer of common intelligence may judge whether an application of calcareous manures will prove in his individual case judicious or not. Seeing, however, that if guano was reduced £2 per ton, that other fertilising agents, as superphosphate, bones, &c., would be reduced in proportion - say superphosphate to £5 per ton in place of £7—it is not unfair to presume that the farmers of Great Britain pay not less than £750,000 per annum more than they otherwise would do if they adopted energetic measures for composing at home that which they now obtain from Peru. Now, £50,000 is amply sufficient to practically prove the correctness of my position, whilst the actual risk to the shareholders in such an undertaking would not exceed £10,000, or 2s. per share on 100,000 shares. Yet trifling as is the risk, and immense the benefit, that may thus be obtained, it appears greatly beyond the enterprise of the landed interest of Great Britain; for notwithstanding I have set out these facts, and issued communications to more than one thousand of the most influential landed proprietors, the answers generally received, whenever replies have been obtained—the latter not always occurring—have been usually of that coldly civil character known under the denominations of "wet blankets," "dampers," and "throwing cold water," over any subject. Out of this category, it is only due to mention two exceptions, one a member of the House of Peers, and the other a Baronet and a member of the House of Commons, both of whom have most heartily responded to my request when seeking their assistance towards my endeavours in establishing the object just alluded to. So much for the interest taken in this subject by the landed aristocracy! By this class the matter is usually treated after the following manner. I write from personal experience, and with scores of letters before me, of which the following may be considered a literal copy, all but the name:—

"Lord A. B. C. has received Mr. R.'s communication, and fully appreciates the importance to the agricultural interest of obtaining a reduction in the cost of artificial manures generally, and also preventing their fraudulent adulteration; but Lord A. B. C. is otherwise so much engaged that he cannot spare any time in attending to this subject. Wishing success, &c., &c.

"Battledore Hall, Sept. 1, 1852."

Now as communications similar to the above have been received from parties possessing landed property yielding incomes from two to three hundred thousand per annum, in the name of the fiend—for it would make Job call upon "Old Harry," "Nick," or any other of the numerous polite aliases under which his Satanic majesty is so frequently invoked—if the wealthy proprietors of the soil possess neither the time nor the will, and are indisposed to furnish the means for effectually reducing the cost of guano, who is to stand the brunt of the contest? Is it to be, as usual, the tenant farmers? if so, are *they* likely to take any active steps in the matter? To the latter query I may remark, that I do not think they will, neither ought it to be expected of them. The landed interest ought to take the subject up as a public question; and if a moiety of the trouble had been exerted to bring into practical operation a chemical manure manufactory that there was to form a deputation to meet Lord Derby, with the object of inducing the English Government to terrify the poor Peruvians into a reduction of the price of guano, this important problem would by this time have been satisfactorily solved.

It is true that the Royal Agricultural Society of England have offered a prize of £1,000 for the discovery of a manure equal in fertilizing properties with guano at a price not exceeding £5 per ton. With a better appreciation of the pecuniary value of such a discovery, a gentleman, whose office is not many yards from the Royal Exchange, states that he will pay £100,000 for similar information. It is now more than fifteen years since I first turned my attention to agricultural chemistry, and during the interval I have been engaged in works where metallurgy and manufacturing chemistry have been carried forward on the most extensive scale; whilst practically engaged in these operations it has been my constant study to devise modes of economizing the cost of many processes by combining therewith the conversion or utilization of many waste products as manures. I know that practically this can be accomplished to a large extent, and believe it is just possible that a manure may be made at £5 per ton equal in value to guano; but of this I will pledge my reputation, namely, that one

can be made at £7 per ton. This is not, however, to be effected by the mere admixture of known and plentiful substances in certain proportions: the operation is far more recondite and difficult. The only means by which the desiderated end can be obtained is by the establishment of a chemical manufactory, having for its main, rather than a subsidiary object, the formation of cheap and good manures. The *modus operandi* may be generally described by stating, that in the manufacture and refining of many chemical articles of considerable commercial value and great consumption, residuary and bye-products are obtained not adapted for commercial sale without previously undergoing an expensive purifying process; many of these frequently contain all the elements of fertility, and can, therefore, be at once economically converted into manure. An establishment as here contemplated would not, therefore, be dependent solely upon making manures, but would have—to use the old adage—"two strings to its bow."

Now, under the present mode of proceeding, the waste products of chemical works are not unfrequently bought by manure makers in order to sell them alone, or mixed, to the farmers—an operose mode not at all competent to fill up the void which exists.

One reason why commercial men and the proprietors of great chemical works have not paid attention nor invested capital in the manufacture of manures arises from the fact that they have no reliance on farmers using them if made. "They are such a slow set," is the usual expression. Now I believe no opinion is more ill-founded than the one just alluded to; on the contrary, a proneness exists amongst agriculturists generally to adopt any new manure, and of this circumstance manure quacks don't fail to take advantage. I may mention, that of the numerous communications I have had on the subject during the past month, nearly the whole express a willingness to give any new article a fair trial.

In concluding these remarks, which may perhaps be the last I shall ever write on English agriculture, it will be well to examine into the cause or causes which contribute so much towards the apathy and supineness of the landed proprietors of England on the important subject of discovering the cheapest means of fertilizing their fields, and consequently enhancing the value of their property. Fifteen years ago no scientific *rationale* of agriculture existed, and even chemistry, as a science, was only studied by an enthusiastic few in chemical classes at Mechanics' Institutes and similar establishments; within the last ten years chemistry has become an elementary branch of general education. Prior, however, to either of the periods named, more than nine-tenths of the wealthiest landowners of Great Britain had not only arrived at "man's estate," but many had even approached the "sere and yellow leaf" of age. In imputing, therefore, a general want of special scientific knowledge on the part of the great bulk of the landed proprietors of the British dominions, it must not be inferred that I am at all desirous of casting any such imputation as that of their being deficient in general learning; my only object is to show that they do not—neither could it be reasonably expected that gentlemen advanced in life should—intuitively become acquainted with the practical application to ordinary farming of such a recondite science as chemistry. In fact, the plain truth may as well be at once told:—The mass of landowners and farmers have no faith in chemistry as applicable to agriculture; the consequence is, they shun investing capital in any undertaking having for its object the composition of chemical manures. The failures of many vaunted discoveries have strengthened this feeling. On this point, however, it will be well to observe that these failures have arisen owing to the be-puffed articles not possessing the requisite elements of fertility in adequate proportion and available forms. Wherever phosphoric acid, potash, and the elements of ammonia have been compounded in proper quantities, and in forms neither too much soluble nor insoluble, luxuriant fertility has invariably followed their application. I challenge the world to produce an instance of failure where these conditions have been strictly attended to. Several—with that misty indistinctness arising from imperfect scientific knowledge—draw largely on the regions of fancy with respect to the rich harvest in store for farmers from principles yet undiscovered. That there are fields almost untrodden, and truths not yet elucidated that shall shed a halo of glory on their explorers and propounders I am fully prepared to admit; the effulgence of whose rays will reflect a light sufficient to illuminate the steps of the husbandman amongst the numerous paths now almost hidden in Cimmerian obscurity is also probable. Whilst admitting all this, and leaving the region of metaphor and fancy for the sober dominion of reality and naked everyday facts, let us examine into the real state of the case as regards the probability of supplying a good manure at a cheaper rate than guano.

As guano does not afford potash in any proportion worth noticing, and phosphoric acid can be obtained from other sources in abundance, as bones or apatite, the real difficulty consists in obtaining ammonia. Now, the only source whence we can seek for ammonia in any adequate quantities is from our coal measures; and, in order to effectually compete with guano at £7 per ton, the price of sulphate of ammonia ought not to be above £8 or £9. The consequence, however, of a large demand on limited supplies is to enhance the price; and, unless means be devised to economize the waste of ammonia from ordinary fur-

naces, &c., the total supply as now afforded by the gas works, &c., is totally inadequate. Whether the destructive distillation of coals and the accompanying shales could be profitably carried forward, and thus increase the supply, is a problem that has yet to be solved. The extension of gas lighting for domestic purposes, and as an agent for producing heat in dwellings, may contribute to the end desired. Indirectly, also, the discoveries of Professor Way on the absorptive powers of the hydrated double silicates of alumina, and lime, magnesia, soda, &c., may possibly contribute much to lessen the dependence of the farmer on extraneous sources of ammonia; the extent, however, to which this can be attained, and the economical production of these hydrated double silicates, are as yet unsolved problems. Reviewing the whole question, it therefore appears that in our present state of knowledge no other chance exists of obtaining a rival to guano than the establishment of some such a manufactory as that indicated in a former part of this paper: one in which all the resources of science shall be brought to bear so as to economize and utilize products often now wasted, and, in some instances the driving off which is a source of expense, adapting these and other waste materials and products of inferior value to the purposes of husbandry. Great as the improvements have been in manufacturing chemistry during the last century, it ought not to be forgotten that the temptation to the exercise of ingenuity arose mainly from the circumstance that objects of large and growing consumption, and at continuously enhanced prices, owing to such increased use, attained not only high prices, but were gradually advancing. In the case of manures, however, we have two articles required of an expensive character—ammonia and potash—which relatively, as compared with the power of consumption in the form of manures, are only of very limited production; whilst, on the other hand, the demand for them for manures at a low price would be to practical purposes unlimited. It is on account of these reasons that the composition of a good and cheap manure is surrounded with so many difficulties—not insurmountable certainly, but to overcome which requires a somewhat rare combination of practically scientific, manufacturing, and commercial knowledge on the part of the superintendent on whom the management of such an establishment may be entrusted.

Appendix.—Since the preceding was written I have seen some remarks in "Notes and Queries," under the title of "Guano and the Lobos Islands"; quoting the translation of an old Spanish work, wherein a very accurate description is given, not only of guano, and the islands from which it is obtained, but also comparing this substance to "Terra Britannica," as alluded to by "Cardanus," who states that they (the British) were fain to dig very deep mines to come at it—(Terra Britannica)—with which they manured their fields: an application being said to have sufficed for 100 years. A reference to what has been stated on Lime, and "Top-dressing soils with mineral substances," will show that the opinion of the lasting quality of lime is correct. It would be curious if future researches should disclose the fact that our phosphoric strata formed an ancient article of export, under the term "Terra Britannica."

23, *Grove-place, Brompton, Oct 9th*, 1852.

THE GUANO DIGGINGS.

Three rocks, without a blade of grass upon them—their brown surface cracked by a hot sun, whose beams are rarely intercepted by a cloud—rocks upon which no rain has fallen since the deluge—yield at present the chief riches of Peru. They are the Chincha Islands. Ships are ever gathering about them to bear off the fatness covering their ribs; that is to say, the guano, which shall fertilise the overtaxed and wasted fields of distant countries. To this guano district may now be added that of the Lobos Islands, to which Peru lays a disputed claim; but I believe that the deposit of guano in the Lobos Islands falls far short, both in quantity and in quality, of that on the Chinchas, from which all the Peruvian guano brought into Great Britain has been taken.

My starting point for the guano diggings was Port Philip or Victoria, as it is now called; but we are now going gently, if you please, before the south-east trade wind, just opening out the bay of Callao, the seaport of Lima. For the last few hours we have been gliding slowly along the coast, gazing upon scenery which I should like to describe, but dare not; for though, like most sailors, a pretty good hand at painting a lower masthead or a topsail yard, I can make nothing of a sketch in pen and ink. Paint for yourself, therefore, the huge masses of rugged brown mountains, rising their steps from the green sea, and the white surf at their base, until the pure blue sky seems to be resting on their distant peaks, where the harsh contrast between earth and air is softened, less by distance than by the dim glitter of the everlasting snow. A fleecy bank of cloud ascending from some unseen valley belongs also to the picture.

Though we are bound only for the Chincha Islands, yet we come to an anchor at Callao; we have already passed the islands once. Here I may say a word on what is a great annoyance to all masters of ships visiting Peru, and a source of additional expense to English ship-owners and charterers. Every guano ship is compelled to enter inwards and outwards at Callao; thus, in the first place, sailing about one hundred and fifty miles beyond the islands to reach the port; then, always against a head-wind, beating the hundred and fifty miles back again to Pisco, a small port close to the Chinchas. Here she anchors, and goes through some formal performance or other, remaining sometimes two or three days. Then she sails back again nine or ten miles to the islands, where she loads and afterwards returns to Pisco.

Then she goes back to Callao, and finally passes the islands for the fifth, and happily the last time, on her homeward passage. Over all this battledore duty a ship often wastes nearly a month, besides generally losing some of her hands from desertion in Callao. Certain it is, however, that there is invariably more formality in petty principalities and dwarf republics, than in states which are more able to enforce respect. Peru is by no means a tremendous power, and it is a token of good in the way of civilisation, that the huge merchantmen should let themselves be bullied by her, when the whole fleet of the golden republic might be sailed off with in one parcel, quietly stowed away on board a Cunard liner. It consisted, when I saw it, of the steamer Rimac, two guns; the brig Gamarrez, eight guns; and a little schooner of four guns; the latter stationed at the islands to enforce respect from some sixty or seventy vessels of all nations.

And now up comes the anchor from its berth amongst the ruins of the old town of Callao, over which our ship is floating. A long low point still shows the remains of the last meal made by the earthquake, which, like a dragon with the stomach of an ostrich, has so frequently snapped up tit bits of town, that the inhabitants appear to have declined providing stone-fruit for it. The present houses of Callao are mere sheds of cane and mud, which, in case of a disturbance, yield no heavy brick-bats to be cast down on the heads of their inhabitants. Tall houses built of any heavy material are not eligible residences in an earthquake district.

After five days tacking against the trade wind we round the large island of San Gallan, which forms part of the Chincha group, but contains little guano. We anchor then before the town of Pisco—a little Callao in point of size, but greater than Callao in the points of dirt and drunkenness. It gives its name to a kind of white brandy, well known in the South Seas. It is also especially noted as the residence of an English butcher, who supplies his countrymen with all manner of provisions, from green turtle to red herrings. I have little doubt that his prices are remunerating, as he has the shipping trade all to himself.

Again the ship is in motion, and in an hour the proximity of the guano islands is evident to all but the most nominal noses, for though still five or six miles to windward, the scent of the guano becomes stronger at every ship's length. The three islands lie nearly due north and south; the breadth of the passage between them being about a mile in one instance, and two miles in the other. The south island is as yet untouched, and from a visit I paid it, I should suppose it to contain more guano than is found in either of the others. The middle island, at which we loaded, has been moderately worked, but the greatest quantity of guano is taken from the north island. In their general formation the islands are alike. They all rise, on the side next the main land, in a perpendicular wall of rock; from the edge of this precipice the guano then slopes upwards to the centre of each island, where a pinnacle of rock rises above the surface; from this point it descends to the sea by a gentle declivity, the guano continuing to within a few feet of the water. Each island has, at a distance, the appearance of a flattened cone, but they have all been originally broken into rocky hills and valleys. The deposits of guano having gradually filled up the valleys and risen above the rocks, the cuttings of the guano diggers vary from a depth of eighty or a hundred feet to merely a few inches. Though the islands are not large—their average circumference being about two miles—the accumulation of guano is almost incredible. Calculations as to the probable quantity must, on account of the varying depth of the deposits, be very uncertain. I remember making an average of the depth, and deducing therefrom a rough estimate that the three small islands alone contain upwards of two hundred and fifty millions of tons of pure guano, which at the rate of supply which has been going on during the last five or six years, would require about one hundred and eighty years for removal; and, at its English value—which, after deducting freight, is about five pounds per ton—would be worth about twelve hundred and fifty millions sterling. This is exclusive of vast quantities which have been used by the Peruvians themselves.

A recent traveller in the country asserts that guano was used in the time of the Incas, and that the Spaniards learned its use from the Indians, who employed it constantly. It is chiefly applied in Peru to the cultivation of maize and potatoes. The mode of applying the manure differs from that generally adopted in England. After the plants appear above the ground, a small trench is opened, in some cases round each root, in others along the lines. In this trench a small quantity of guano is placed, and slightly covered with earth; the whole field is then laid under water, and allowed to remain in that condition for a certain number of hours—from 20 to 24. The water is then drained off, and the effect of the process is soon manifest in the rapid growth of the plants. Where a sufficient supply of water cannot readily be procured, other means of irrigation are adopted, but the guano is never sown broadcast, as in England. The name itself is Indian, originally huanu, signifying the excrement of animals, but altered to huano by the Spanish Peruvians; and owing to their strong aspiration of the h, the English have taken the words from their lips in the shape of guano. It is found on all parts of the coast of South America, even so far south as Cape

Horn; but that obtained from the Chincha Islands is the most highly prized, probably from its extreme dryness, as the islands lie within latitudes in which —on that coast—rain never falls.

And now, having anchored between the north and middle islands, at the latter of which we are to load, we will borrow the boat and have a closer look at the huge muck heap. Pulling half round the island to the landing place, we step on shore on a narrow slip of sandy beach, which appears to be cleared from the surrounding rocks for our special convenience. Our appearance disturbs thousands of the web-footed natives; these thousands count with the old hands as nothing, for they tell us that the shipping have driven all the birds away. Sailing above us is a flock of pelicans, hovering over the clear water like hawks, which they resemble in their mode of darting down or stooping on their prey. One of these every instant drops from the flock as though a ball had whistled through his brain; but, after a plunge, he is soon seen rising to the surface with a fish struggling in his capacious pouch. Nearer to us, whirling round our heads, are gannets, mews, mutton-birds, divers, gulls, guano-birds, and a host of others whose names are unknown to the vulgar. On the detached rocks and the lower edge of the island—member of a pretty numerous convocation—stands the penguin, the parson-bird of the sailor, whose good name is fairly earned by his cut-away black coat, white tie, and solemn demeanour. His short legs planted far back, and his long body do not fit him for a walk ashore; but he will sit for hours on a little rock just washed by the waves, apparently in such deep absence of mind that passers-by are tempted to approach in hope of catching him. Just as the boat nears him, and a hand is already stretched out to grasp his neck, away he goes head over heels in a most irreverent and ridiculous manner, dives under the boat, and shows his head again about a quarter of a mile out at sea, where the sailor may catch him who can, for he is the fastest swimmer and the best diver that ever dipped. Stepping over the mortal remains of several sea-lions, in a few strides we are on the guano, and at the next step, in it up to our knees.

The guano is regularly stratified: the lower strata are solidified by the weight of the upper, and have acquired a dark red colour, which becomes gradually lighter towards the surface. On the surface it has a whitey-brown light crust very well baked by the sun; it is a crust containing eggs, being completely honeycombed by the birds, which scratch deep, oblique holes in it to serve as nests, wherein eggs, seldom more than two to each nest, are deposited. These holes often running into each other, form long galleries with several entrances, and this mining system is so elaborately carried out, that you can scarcely put a foot on any part of the islands without sinking to the knee and being tickled with the sense of a hard beak digging into your unprotected ankles. The egg-shells and the bones and remains of fish brought by the old birds for their young, must form a considerable part of the substance of the guano, which is thus in a great measure deposited beneath the surface, and then thrown out by the birds.

Having with some difficulty, and the loss of sundry inches of skin from our legs, reached the summit of the island, we descend the side leading to the diggings, and soon arrive at the capital. It stands on a small piece cleared of guano, and consists of twenty or thirty miserable shanties, each formed by four slender posts driven into the ground, with a flat roof of grass matting and pieces of the same material stretched on three sides, the other side being left open. Scarcely an article of furniture do these town residences contain, except a few rude benches, two or three dirty cooking-pans, and some tin pots. In one or two of the huts stands a small "botiga," (a curiously-shaped earthen jar) filled with pisco, the spirit before mentioned. The beds are simply thin mats, and only a few of the inhabitants possess the usual red blanket of the Peruvian.

Clothes seem to be almost discarded: an old poncho and a ragged pair of calico trowsers, form the dress of the aristocracy, but many are all but entirely naked. One hut of greater pretensions than the rest is occupied by two English sailors, who have taken a fancy to the island, and call themselves pilots, as they profess to moor and take charge of the ships during the business of loading.

Close to the town is a rough and steep path to the sea, up which are brought the provisions and water, the latter supplied by the shipping in turns. On the north island is a similar but larger collection of dwellings; there, too, resides the commandant, a military-looking old gentleman—one of the high aristocracy, for he lives in a house that has a window in it. On the north island are about two hundred men, on the middle about eighty, usually; the number varying with the demand for guano. These people are nearly all Indians, and appear to be happy enough in their dusty territory; though every thing about them, eatables included, is impregnated with guano. They earn plenty of money, live tolerably well according to their taste, work in the night, and smoke or sleep all day. To get rid of their wages, they take an occasional trip to Pisco, where they spend their money much in the same fashion as sailors, substituting pisco and chicha (maize beer) for rum and ale, and the guitar and fandango for the fiddle and hornpipe.

In getting the guano, the diggers have commenced originally at the edge of the precipitous

side of the island, and worked inland; so that the cutting now appears like the face of a quarry worked into the side of a hill. The steep perpendicular face of the rock, which rises from the sea like a wall, and the boldness of the shore—there is seven fathom water close in—have afforded great facilities to the loading of ships. On the top of the cliff is a large enclosure formed of stakes, firmly bound together by strong chains passed round the whole. This enclosure is capable of holding four or five hundred tons of guano. It is made wide and open at the upper end, and gradually slopes down to a point on the extreme verge of the precipice, where a small opening is left, exactly fitting which is a large canvas shute or pipe, which hangs down the face of the rock, nearly to the water. The ship, having taken in by means of her boats enough guano to ballast her, hauls in to this shute, the end of which is taken aboard and passed down the hatchway. The guano is thus poured into the hold in a continuous stream, at the rate of about 350 tons a day, the inclosure being filled by the Indians during the night. They carry the whole of the guano down on their backs in bags, taking about eighty pounds at each journey.

Some are employed in pushing the guano down the shute, at the mouth of which is stationed an Indian, who, by tightening a rope passed round it, regulates or stops the descent of the manure. To various parts of the long pipe ropes are attached, which lead to the different mast-heads of the ship, and thence on deck, where each rope is tended by a man who, by successively hauling on and slacking it, keeps the shute in motion, and thus hinders it from choking. This choking, however, now and then occurs; and it is then a difficult and tedious matter to set right again, as the pressure binds the guano into a compact mass, which can sometimes only be liberated by cutting the shute open. Birds are frequently carried down into the ship's hold; and at one of the islands, an Indian, accidently slipping in, was forced through the shute, and taken out at the other end quite dead. On each island there are two inclosures and two shutes, one, much smaller than the other, being used only for loading boats.

After making ourselves fully acquainted with all the economy of the island, we retrace our painful path to the boat, and pull off to the ship, where the day being Sunday, there is no work going on, and we can amuse ourselves with the scenery around us. Every little hollow in the islands has been gradually filled up, until the surface is nearly levelled; the general dark brown hue singularly broken by scattered projecting crags, white with *huanu blanco*—newly deposited guano. Round the base of the islands little rocky peninsulas jut out, bored through in many places by the constant washing of the Pacific, whose gentle waves have insinuated themselves many yards into the solid rock, and have formed caverns which are the resort of numerous sea-lions. The time of these hermits seems to be divided between dozing in their gloomy-looking cells, and making hungry irruptions on the shoals of little fish which frequently pass through the channels. I have often watched these little fellows—packed in such dense masses that they seem to have scarcely room to swim in—moving rapidly along, a spray of them every moment leaping from the water and glittering for an instant in the sun; all evidently ignorant of the neighbourhood of any enemy. Suddenly, in the very middle of the party, rises a black, ugly head, and instantly all is confusion—a dozen unfortunates are swallowed at a mouthful. Other heads, equally ugly, pop up in unexpected places, and you can distinctly hear the snapping of the sea-lion's jaws as he works through the flying shoal, and finishes a dinner worthy of a cardinal in Lent. It is not, however, all small fry: whales often come gambolling between the islands, rolling and playing in the sun, and sometimes leaping clean out of the water, into which their huge bodies descend again with a crash that seems to shake the sea itself, and turns the surface into one great frothy washing-tub, amidst the suds of which the giant slowly sinks, throwing up his broad black flukes as if in derision.

But now our work begins in earnest. Ballast is hoisted up, and thrown over the side, and the long-boat is busily employed in bringing guano to replace it. Most unpleasant work that is. I was one of the boat's crew, and, since of course much rivalry exists between the ships, that all desire priority in trading, we were at work night and day, leaving our ship at night, and remaining under the shute until morning, so as to obtain the first load for our boat. I shall not forget the dismal hours we passed there. Close to us—every surge of the boat sending her into its mouth—was a dark cavern, into which the sea poured with one continuous roar. A few fathoms distant stood an isolated rock, every wave dashing boldly up it, and then falling back in sheets of foam, and scattering all around in showers of heavy spray. On our right, moored to the rocks, lay a loading ship, her warps and cables slacked for the night, leaving some twenty feet of dark water between her and the huge black cliff; the base of the cliff marked by the bright line of light which ever glitters on the broken wave of the Pacific. Glancing aloft, we saw, rising and falling with the ship's motion, the long white shute, like a fairy footpath up the rock; whilst drawn upon the clear blue sky, were lifts and braces, bowlines, stays, and all the maze of rigging so familiar to the sailor. And there, beyond, lay the dark sister island; her shores, too, lighted by

the white ocean-fire, which, in a long dim surf-line, marked the more distant coast of the great continent itself, from which rose in the moonlight the stupendous masses of the Cordilleras. Before morning the heavy dew and heavier sprays had thoroughly diluted the romance of our position, and, when day dawned, we were glad to get the shute into the boat, and cheer ourselves by shouting, in horrible Spanish, to its Indian guardian to let go the guano. In a few minutes down came the shower, and eyes, mouth, and nose were filled with the pungent dust, which continued to pour in until the boat was loaded to the water's edge, and its occupants looked like a portion of the cargo. One old salt, whose bushy black whiskers and long hair contained enough manure to satisfy a small farm, very energetically cursed all the farmers in the world for employing sailors to do their dirty work, instead of coming themselves and carting home the guano in their own broad-wheeled waggons. The boat being loaded, we pulled her slowly off to the ship, where her cargo, having been filled into bags, took the place of the discharged ballast. This sort of work continued for about three weeks, before our turn to haul under the large shute arrived.

Our bill of fare aboard would have attractions for some people. Turtle was our commonest dish, as the skipper found it cheaper to give a dollar for a turtle weighing fifty or sixty pounds, than to supply us constantly with the contractor's beef from Pisco. Our turtle soup, however, would not have passed muster at Guildhall, though thick enough for sailors. Then we had camotes, a sort of sweet potato, which attains a very large size, and is generally liked by Englishmen; yuca, a root resembling a parsnip; frijoles, fish, mutton-birds; plenty of seasoning, such as tomatoes, Chili peppers, and aji; and abundance of fruit-melons, grapes, bananas, chirimoyas, alligator-pears, &c.: the meat-boat being always well supplied with articles of this kind. It brought also, occasionally, a few bladders of pisco, which, being contraband, were smuggled with the due formalities.

At length, one of the English sailors living on the island came off and took us alongside, seeing that we were moored in a proper position for receiving cargo. With him came half a dozen Indians; Cholos, we call them—that is, a name applied by sailors to all the different coloured races in Peru, though it is the especial property of one tribe only. The duty of these men is to trim the guano in the ship's hold, as it pours out of the shute. The nature of their work may be imagined. The hatchways are quickly choked up, and the atmosphere becomes a mere mass of floating guano, in the midst of which the trimmers work in a state of nudity; the only article of dress with some of them being a bunch of oakum tied firmly over the mouth and nostrils, so as to admit air and exclude the dust. They divide themselves into two parties, one relieving the other every twenty minutes. When at work they toil very hard, handling their sharp-pointed shovels in a style that would astonish even an English navigator, and coming on deck, when relieved, thoroughly exhausted and streaming with perspiration. But in this state they swallow a quart of cold water, qualifying it afterwards with a large dose of raw rum or pisco, and then, throwing themselves down in the coolest part of the ship, they remain there until their turn comes again to resume the shovel.

The ship's crew is employed tending the bowlines attached to the shute, and, though working in the open air, the men are compelled to wear the oakum defences, for the clouds of dust rising from the hold are stifling. The ship is covered from truck to keelson; the guano penetrates into the captain's cabin and the cook's coppers—not a crany escapes. the very rats are set a sneezing, and the old craft is converted into one huge wooden snuff-box. The infliction, however, does not last long, three days being generally sufficient for the loading of a large ship. At the end of three days, right glad was I to see the hatches on, the mooring chains hove in, and the flying jib-boom once more pointing towards Pisco.

Here we stayed another three days, which we employed in washing down and trying to restore the ship to her original colour. When we left the Chinchas, yards, masts, sails, rigging, and hull, were all tinted with one dirty brown. This cleansing finished, we again tripped our anchor, passed the north island, receiving and returning the cheers always given to a homeward-bound ship, and with studding sails on both sides, ran merrily down before the steady trades, reaching Callao in thirty hours. There the hands, who shipped merely for the coasting voyage, were discharged, and we who remained were soon over-head, in one of the many little streams which water the pampas lying between Callao and Lima, eager to wash out the alloy of guano with which our skins had been amalgamated at the diggings.—Dickens's Household Words.

DEEP-PLOUGHING LEA FOR OATS.

As there is a diversity of opinion as to the propriety of ploughing lea with a deep furrow for a crop of oats, the following results of an experiment on the Home Farm, at Thirlestane Castle, betwixt equal quantities of land ploughed with the Marquis of Tweeddale's three-horse plough, and the common two-horse plough, may be interesting as well as useful. It may be premised that the whole field of 12 acres or so was ploughed with the three-horse plough to the depth of 9 to 11 inches, except two ridges nearly about the middle of the field, which were ploughed with the two-horse plough, to

the depth of from 5 to 7 inches, thereby making an average extra depth of 4 inches in favour of the three-horse plough; immediately after "brairding," the oats upon the deep-ploughed land showed a more vigorous growth and broader blade, and on a narrow observation their superiority continued throughout the season, although the frequent showers, and the general fineness of the season, caused, it is believed, much less difference betwixt them than had the season been droughty, or otherwise less favourable.

Comparative weight of grain and straw from two ridges ebb-ploughed, and from two ridges on each side of these which were deep-ploughed:—

	Extent of land.		Gross weight of corn & straw		Wt. of grain.		Wt. of straw.		Grain per acre.
	roods	poles.	st.	lbs.	st.	lbs.	st.	lbs.	bushels
2 ridges ploughed with 3 horses .	2	14	335	10	108	1	227	9	60½
2 ridges ploughed with 2 horses .	2	14	332	2	103	0	230	2	57⅓
2 ridges ploughed with 3 horses .	2	14	372	6	109	6	263	0	62⅓

Average excess of the four deep-ploughed ridges over the two ebb-ploughed, per acre—

Straw.	Grain.
26 stones.	4½ bushels.

N.B.—The above is all calculated at 14 lbs. to the stone. Other trials have been made on neighbouring farms, which, when tested, will be published.

It is necessary here to remark, that there is no difference of expense in ploughing the land with the three-horse plough, as the additional breadth turned over nearly compensates for the third horse, besides the additional depth attained, so that two three-horse ploughs turn over as much land as three two-horse ploughs, the three-horse ploughs requiring one plough-man less; and it is also worthy of remark, though already pretty generally known, that the mould-board of the Marquis of Tweeddale's plough is so constructed as to act similar to a subsoil plough, being tapered up from the bottom towards the back part, thereby merely stirring the earth at the bottom of the furrow, to the depth of two or three inches, without bringing it up to the surface.

On the same farm the whole fallow break was ploughed with the three-horse plough, to the depth of from 14 to 16 inches, and was so well pulverised as to require no spring furrow, but was merely grubbed with Tennant's patent two-horse grubber, which made excellent tilth for sowing the turnips.

THOS. HUME.

Lauder, Sept. 21, 1852.

A SINGULAR OCCURRENCE CONNECTED WITH THE HISTORY OF THE HONEY BEE.—If you think the following communication worthy a place in your *Magazine*, you are at liberty to insert it, as it may be interesting to some of your readers who look to such publications for any article connected with the history of the honey bee (Apis mellifica). I have for several seasons past had the management of a few hives, the property of the Rev. Mr. Jones, of Barnet Common, Hertfordshire. This spring he had two stock hives; and near the end of February I went to see if they had survived the winter, and whether their stock of provisions was exhausted, and would require feeding or not. After I had done examining the two hives, Mrs. Jones requested me to put a glass on the top of one of the hives for the bees to work in, for the purpose of obtaining some pure honey, or what is termed "Virgin Honey." I did as she requested me; covered the glass over; and left the bees. On the second day of May Mrs. Jones called on me early in the forenoon, and requested me to come and look at one of the hives, as many bees were in a cluster outside the hive, and she thought they were likely to swarm, as the morning was cloudy and so very early in the season. I thought that they might not swarm for a few days, although they were clustering outside the hive, as I have had my own bees situated in the same way under the alighting board for a considerable time before swarming. Between twelve and one o'clock the same day I went into the garden to examine the state of the hive just alluded to; I had only been there a few minutes when, in the hive that the glass was placed upon in February, a fine swarm came off. No time was lost in putting them into a hive, and, strange to say, a few minutes after the second hive swarmed also. The bees had made no comb in the glass placed on the top of the hive. On the fifteenth day after the two hives swarmed I called at the residence of the Rev. Mr. Jones to see if there was any appearance of either of the two hives throwing (in Apiarian language,) "a cast", and seeing the bees of one of the hives in a state of agitation, and apparently no work going on, I concluded that they might come off that day; and in a short time they came off, and I put them into a hive. I had just finished hiving the bees when the other hive sent out a cast also. It is rather a singular circumstance, that the gentleman has only the two stock hives. If he had been in possession of a considerable number, no notice might have been taken of such an occurrence; but, having only the two hives, and both to swarm on the second day of May, and each of them to throw a cast on the fifteenth of the same month, is unusual. What is still more remarkable, one of the swarms swarmed the latter end of July, and lodged on a tree in the garden; but the gardener informed me that some time elapsed before they could get a hive, and, the wind being rather high at the time, they took to flight, and he followed them some distance across the fields, but they did not settle in the neighbourhood, and consequently he lost them. It is, I think, not a common occurrence in this country, even in good seasons, for a swarm to throw off a swarm, and more especially as this has been the coldest spring experienced in this neighbourhood for many years. It was not until the middle of June that the bees could do any good—the season being so very backward. Perhaps, this may attract the attention of some one who has a more extensive knowledge of the practical manage-

ment of this most useful insect than I have. If so, I should like to know if such a circumstance as the above is of a common occurrence in this country—ROBERT DOWNIE, *Arkley Lane Cottage, Barnet Common, Herts.*

THE WILD POPPY.

Perhaps there are few weeds which, taken all in all, occasion so much trouble to a class of farmers as the wild poppy. On the new and old red sandstone formations, especially the higher-lying portions of soils on these strata, it is an incessant source of injury and of trouble. It possesses all the characteristics of the other truly indigenous weeds. It is insignificant in its very early stages, and therefore bad to grapple with. It grows most after the hoe can be of little service, and it branches out so rapidly and so tenaciously that it often overtops the corn. In some seasons it is absolute master of the crop, and hence we have what is called "a poppy year." And further, it is a plant which "grows for its life." In a very short time it matures its seed, and that so small and oily that it will not only infest the land for a long period, but will spring up in all the corn crops with a rankness which always succeeds in injuring and sometimes in destroying a crop.

This seed seems to possess an instinct. We never see it in artificial pastures, where it could not make head, or mature its seed. We as rarely see it in turnips. It seems to reserve its vitality for an attack on the wheat and the barley, and then it ravages unrestricted and at leisure.

In a spring ungenial to the rapid growth of corn, especially from drought, it seems to have special encouragement, and to make uncommon progress. While a season just suited to its habits will develop it where the soil will be ordinarily free, it is most prevalent where the soil is light and uncompact. It seems to require a large amount of oxygen to stimulate its germination; for in a cold, wet spring there is seldom much trouble with it.

We had a very remarkable instance of the many unlikely modes in which it may be fostered: we had about an acre, in an irregularly-shaped piece, where the turnips were sadly injured by a blowing day in July. The sand cast off the leaves, and they only rallied so as to be a covering, not a heavy crop. This increased the evil of the light soil, for the crop of turnips being lighter, the land got by far less consolidated than even its share, and the barley was drilled on the whole field alike. The acre which had blown was a mass of red poppies, and as the land was sown with seeds the hoe could not be applied, and the barley was seriously injured. How was this? The land where the sand had injured the turnips suffers from the poppy! Doubtless the cause arose in the natural lightness of the soil being less consolidated than it would be by sheep-treading, and so the development of the poppy is fostered and encouraged.

But how did it happen that the poppies did not also assert their dominion over the seeds? for in the sheep pasture now being eaten not one is to be found. This is not very easy to account for; but it is possible that consolidation of the soil, from its remaining undisturbed, has been unfavourable to their development.

We were some years ago assured by Mr. Paul, the celebrated Suffolk agriculturist, that he had adopted a never-failing plan of destroying the poppies without injuring the corn, and at a very small expense. In one of the hoar-frosty mornings in spring he sent a pair of very small fine harrows over the land infested with the poppies, and if the succeeding morning permitted it, he again harrowed them over anew. This operation, while it did not injure the corn, completely destroyed the poppies. Their leaves, then young and succulent, were so bruised and discouraged by the touch of the harrows while the frost was upon them, that they could not resist the shock, and hence they either died altogether, or were so delayed and crushed in their course of destruction, as never to make their appearance in the crop.

We will detail a very successful mode by which we secured a crop free from them in a field decidedly naturally infested with them. Part of it had, from its distance from the homestead, been used as a spot to stack the corn for several years, and this getting more than its share of the seed, was very liable to be infested. We ploughed the lea—for we selected barley in preference to wheat, the former crop being more manageable, and better capable of having the process applied which we intended—and let it lie perfectly still over the winter. This was the means of germinating one crop of poppies, which would, in ordinary circumstances, have been troubling the wheat. We then dragged and harrowed it over again, allowed it to remain still a second time, till a second crop had germinated, and which a later ploughing in the early part of April again fully destroyed.

Two points were to be gained. Much of the seed had germinated, and could not again trouble us; while the later period of sowing, and the very recent ploughing of the land, gave the corn, and the poppies which might remain ungerminated, an equal chance of success. But we wanted more—we wished to stimulate the barley to rapid growth, so as to overtop the stragglers; but how could this be done, without also manuring the poppies? To have applied a top-dressing was ruinous—it encouraged both: to drill guano with the seed was utter destruction to it.

We had the corn drilled, and while the land remained as left by the drill unharrowed, and full of the indentations made by the drill coulters, we sowed guano broadcast, at the rate of 2 cwt. per acre, and then harrowed. All the guano thus fell in the interstices made by the drill over the corn, and yet not mixed with it. We had a very heavy crop of corn and no poppies, except on a square yard or two, where there was a bed of them—and why? The drill had missed an angle, and no corn had been dropped. Here they swelled in rank luxuriance. No more need be said—the experiment succeeded.—Gardeners' and Farmers' Journal.

ON THE CULTIVATION OF FLAX.

BY RICHARD HODGSON, ESQ., OF CARHAM, NORTHUMBERLAND.

[Premium—The Gold Medal.]

(*From the Highland Society's Journal.*)

Having for some years sown a few acres of flax, with the view of ascertaining its value in comparison with crops in ordinary culture, and of supplying myself with linseed for my stock, I am induced to give a narrative of the results.

In the years 1850 and 1851 only, the portion of land under flax amounted to five acres, and to these seasons I therefore confine myself, in a statement of the comparative expenditure and produce of that with an equal portion of land occupied by oats. The comparison is perhaps the more complete, inasmuch as the rotation has been inverted in these years, viz., flax after oats, and oats after flax- each portion having been previously under the same course of tillage.

I may be allowed to state that my experience on a smaller scale has satisfied me that, where the land has been fairly treated (that is, kept clean, and compensated by manure for the abduction of the entire crop of seed and straw), no depreciation of future crops, whether cereal or radical, can be detected; on the contrary, the depth and accuracy of tillage, and perfect emancipation from weeds, necessary to the successful cultivation of flax, to say nothing of its brief occupancy of the ground, (little more than four months,) and its independence of artificial aid to moderately fertile soil, may be advanced as bases for the opinion, that the *whole* crop, seed and fibre, of flax, may be removed with less detriment to succeeding crops than the *whole* of *any other* crop in ordinary culture; and where the seed, or its equivalent in the shape of manure, is, as it ought to be, restored to the land, few will question the superior efficacy of such a return to that rendered by the straw alone of any of our cereal crops.

It is true that the compensatory value of the seed admits of considerable qualification, according to the actual crop which has been raised: since, if flax be sown thin, (say 1 or 1½ bushels to the acre,) it will produce an abundant and well-filled head of seed, with strong coarse fibre of inferior quality; while, if the seed have been thickly sown, (say 3 or 3½ bushels to the acre,) the fibre will be finer, free from branches, the bolls comparatively rare, and the seed less plump. Still, if the conclusion drawn from the experiments of Sir Robert Kane, and Messrs. Way and Ogston, may be relied on, the exhaustion of the soil is to be measured rather by the quantity of *seed* produced than of *fibre*; and I am disposed to maintain the proposition, that "if the whole of the seed (or its equivalent) be restored to the soil in the shape of manure, a crop of flax exacts less from land than any grain or root crop in cultivation."

I will now proceed to state methodically the circumstances under which my crops of 1850 and 1851 were grown, and the comparative expense and profit per acre of flax and oats.

The land consists of 10¼ acres of medium quality, upon limestone and whin rock; its composition is thus defined by Dr. Anderson:—

Water	3.99
Organic matter	5.02
Peroxide of iron and alumina	4.57
Lime	0.58
Siliceous matter	83.81
Magnesia, potash, soda, Sulphuric acid and phosphoric acid ..	2.03
	100.00

Its altitude is about 150 feet above the level of the sea, being 17 miles distant from the eastern coast of Northumberland.

It had previously been farmed upon the five-shift, and

In 1848 was cropped with barley, and sown with clover.

In 1849, hay was cut.

In 1850, flax to the extent of 5¼ acres, and oats of 5 acres, were substituted for the usual rotation of the second year's grass; ¼ acre, however, of flax was sown for the ensuing year's seed, and therefore the comparison will be made upon a like portion for each crop—viz., 5 imperial acres.

In October, 1849, the land was drained where requisite; and the following extracts from my farm journal will show the management and produce in each case:—

1849. FLAX—1850.

Nov. 30.—First ploughing.

1850.

Mar. 27.—Second ploughing and subsoiling.

April 5.—Land harrowed and rolled twice.

— 8.—2¾ bushels linseed to the acre, sown broadcast, harrowed in with a common light harrow, and rolled. The seed was grown in England in 1849, from Riga seed imported in 1848-9, and weighing 51½ lb. per bushel.

— 11.—Weeds and roots of grass removed.

— 21.—Flax brairded.

July 2.—Flax in full bloom.

Aug. 13 to 21.—Crop pulled, bound and set up.

— 30.—Stacked.

Oct., &c.—Rippled; straw sent to Newcastle to be steeped and scutched, and the seed cleaned for market and home use.

	Tons.	Cwt.	Qrs.
Produce per acre:—Raw straw ..	2	11	2
	Cwt.	Qrs.	Lb.
Giving, of Flax	6	3	14
— Tow	1	1	14

And of seed, 16 bushels, weighing 56½ lb. per bushel; chaff, green seed, &c., 64 bushels.

N.B.—A per-centage must be deducted from the weight of the raw straw, on account of seed and chaff accidentally mixed with the straw in rippling.

Outlay on Flax Crop—1850.

Rent of 5 acres, tithe-free, at £2 ..	£10	0	0
Rates, taxes, and public burthens ..	0	15	0
Seed, 13¾ bushels, at 10s. ..	6	17	6
Ploughing, November and December 1849	1	10	0
Do. and subsoiling, March 1850	2	10	0
Harrowing and rolling, do. ..	1	0	0
Sowing, harrowing, and rolling, April do.	0	18	6
Weeding	0	4	6
Pulling, binding, and setting up, August	3	5	0
Stacking, leading, loading seed and straw	1	17	6
Rippling, tying, and untying ..	5	0	9
Total expense ..	£33	18	9

(Being per acre, £6 15s. 9d.)

Of which is for cultivation and winning of crop, £16 6s. 3d.; (or, per acre, £3 5s. 3d.)

Rate of Wages.—Labourers, 1s. 6d. per day.
Women, 1s. 0d. ,,
One pair of horses, and man, 5s. 0d. ,,

It has been objected by practical farmers that the wages here named are too low, and the cost of ploughing and subsoiling under-stated. I can only say that the wages are those which were actually paid; and with oats at 16s. per quarter, and hay at 6d. per stone of 22 lb. (the ruling prices at the period during which the operations in 1850 were in progress), 5s. a-day for a pair of horses and a man, exclusive of charge for wear and tear of implements and stock, appears to me an ample valuation. At any rate, the same tariff is applied to the comparative expenditure on the oat crop, stated hereafter, in respect of horses and labourers. Of course, the reapers have extra wages.

Produce of Flax per Acre—1850.

Flax, 6 cwt. 3 qrs. 14 lb., at 46s. per cwt.				£15	16	3
Tow, 1 cwt. 1 qr. 14 lb., at 13s. do ..				0	17	10½
Sold in Newcastle for				£16	14	1½
Deduct—Conveyance by railway and delivery in Newcastle of 2 tons 11 cwt. 2 qrs. of flax straw, at 15s. per ton ..	£1	18	7½			
And steeping and scutching do., at 20s. per cwt. of produce in clean flax (viz., 6 cwt. 3 qrs. 14 lb.) ..	6	17	6			
				8	16	1½
Nett value of flax and codilla per acre				£7	18	0
Deduct expenses of cultivation, &c.				6	15	9
Balance of profit per acre, exclusive of seed				£1	2	3
And *seed*—16 bush., at 8s. per bushel (sold), weighing 56½ lb. per bushel	£6	8	0			
Chaff and green seed, 64 bushels, at 3d. ..	0	16	0			
	£7	4	0			
Deduct for beetling, 10d. per bushel ..	£0	13	4			
Winnowing and cleaning, 6d. do.	0	8	0			
	1	1	4			
Nett value of seed ..				6	2	8
Total nett value of crop per acre, after paying rent and all expenses, but exclusive of charge for capital invested in land and stock ..				£7	4	11

1849. OATS—1850.

6th Dec.—Land ploughed.

1850.

26th Mar.—4 bushels potato oats sown to the acre, weighing 42½ lb. per bushel—harrowed in and rolled.

16th Apr.—Oats brairded.

16th June.—In ear.

22nd Aug.—Reaped.

7th Sept.—Stacked.

Oct., &c.—Thrashed.

Produce per acre:—Grain, 40 ¾ bushels, weighing 42 lb. per bushel; 2 do. weighing 37 do. Straw, 2 tons, 6 cwt.

It is necessary to recall the fact that, just before harvest in 1850, a tremendous shake-wind, causing great loss to cereal crops generally, blew for two or three days. The oats in question suffered seriously, while the flax was little injured, being already in the stook. Hence an apparent discrepancy between the produce of grain and straw reported. At least one-fourth of the grain was lost.

Outlay on Oat Crop—1850.

Rent of 5 acres, tithe-free, at £2 ..	£10	0	0
Rates, taxes, and public burdens ..	0	15	0
Seed, 20 bushels, at 2s. 2d. per bushel	2	3	4
Ploughing, Dec., 1849	1	10	0
Sowing, harrowing, and rolling ..	1	0	0
Reaping, stacking, thrashing, &c. ..	5	0	5
	£20	8	9
(Or per acre, £4 1s. 9d.)			
Of which is for cultivation and winning of crop	£7	10	5
(Or per acre, £1 10s. 1d.)			

Produce of Oats per Acre—1850.

40⅞ bushels oats, (42 lb. per bushel,) at 2s.	£4	0	6
2 do. light, (37 lb. per bushel,) at 1s.6d.	0	3	0
46 cwt. straw, at £1 5s. per ton ..	2	17	6
Nett value of oats and straw per acre	£7	1	0
Deduct expenses of cultivation, &c.	4	1	9
Total nett value of crop per acre, after paying rent and all expenses, but exclusive of charge for capital invested in land and stock ..	£2	19	3
In 1850, therefore, flax gave a return of	7	4	11
and oats	2	19	3
Showing a difference in favour of flax, per acre, of	£4	5	8

I have usually, after flax, taken a crop of turnips, liming the land after the flax has been removed, and sowing the turnips with 20 loads of farmyard manure, and 2½ to 3 cwt. Peruvian guano; but this year I determined to ascertain the value of assertions, frequently hazarded, relative to the noxious influence of flax on succeeding crops, unless counteracted by an unremunerative outlay in manure.

It will be observed that neither portion of land, appropriated to flax and oats respectively, received any manure in 1850; in 1851 the cropping was reversed, flax succeeding oats, and oats flax—the whole being sown with 2 cwt. Peruvian guano, and 1 cwt. nitrate of soda, to the acre. I anticipated a material accession of expense in weeding, but on neither portion was this expectation realised, as, with the exception of a few thistles, cut by three women in a day and a half upon the 10 acres, both crops were perfectly clean.

The preliminary outlay common to both may be stated thus, per acre:—

Rent and public burdens			£2	15	0
Ploughing, (1850)			0	6	0
Manure—viz. 2 cwt. guano	£1	0	0		
1 cwt. nitrate of soda	0	16	0		
			1	16	0
			£4	17	0

And to this must be added for flax, (5 acres:—

1851.

March 19. Second ploughing, deep, but not subsoiled	£1	15	0
April 4. Sowing (broadcast) 2¾ bush. per acre—harrowing and rolling	1	0	0
„ 13¾ bush. seed, home grown, weighing 57 lb., at 8s. per bush. ..	5	10	0
April 15. Flax brairded.			
„ 18. Gathering Stones	0	1	0
June 17. Cutting thistles	0	2	3
Aug. 11 to 16. Pulling, binding, and setting up ..	3	10	0
Sept. 1. Stacking and leading	1	2	0
Oct. &c. Rippling, tying, and untying	8	11	3
„ Loading and leading seed and straw ..	0	11	0
	£22	2	6
Or per acre			4 8 6

Flax—1851.

Total expenditure on crop 1851, per acre				£9 5 6
Of which is for cultivation and winning of crop ..	£3	6	6	
.. manure	1	16	0	
.. rent and public burdens	2	15	0	
.. seed	1	2	0	
				£9 5 6

Produce of Flax per Acre—1851.

Raw flax straw, 2 tons, 4 cwt., 0 qr., sold at £3 10s. per ton ..	£7	14	0		
Less 12s. 6d. per ton, freight by rail ..	1	7	6		
Nett value of flax-straw ..				£6	6 6
Clean seed, 15 bush., weighing 56 lb., at 7s. 6d. per bush. ..	£5	12	6		
Less beetling and cleaning, at 1s. per bush.	0	15	0		
				4	17 6
Chaff and green seed, 90 bush., at 3d. per bush.				1	2 6
Total produce of crop per acre ..				£12	6 6
Deduct expenditure				9	5 6
Total nett profit per acre ..				£3	1 0

I would observe here, that the effect of the guano and nitrate of soda upon the flax crop of 1851 was imperceptible; and I believe it to have been a superfluous and unremunerative expenditure, to the extent of £1 16s. per acre. The extra cost incurred in rippling and tying in 1851, compared with 1850, arises from the extreme care which I found to be necessary in the preparation of the straw for market, in order to satisfy the requirements of purchasers, who complained of serious depreciation in the fibre, in consequence of inatten-

tion on the part of growers in separating the seed, and tying up the sheaves.

OATS—1851.

Outlay on Oat Crop, 1851—(5 *Acres.*)

March 18. Sowing 5 bush. common oats per acre, harrowing and rolling	£0	18	6
„ 25 bush. seed, at 2s. 4d. per bush., weighing 40 lb per bush.	2	18	4
April 16. Oats brairded			
June 17. Cutting thistles	0	2	3
Aug. 30, &c. Reaping and stacking	4	16	3
Oct.,&c. Thrashing, cleaning, &c.	3	15	11
	£12	11	3
Or per acre	£2	10	3
Add expense common to both crops	4	17	0
Total expenditure on oat crop per acre, 1851..	£7	7	3

Produce of Oats, 1851---*per Acre.*

67⅔ bush. oats, weighing 40½ lb., at 2s. 6d. per bush...	£8	9	2
3 bush. light, at 1s. 6d. per bush., weighing 36 lb. per bush.	0	4	6
48 cwt. straw, at £1 5s. per ton ..	3	0	0
Total produce of crop per acre ..	£11	13	8
Deduct expenditure, do... ..	7	7	3
Total nett profit per acre.. ..	£4	6	5
In 1851, therefore, oats gave a return of	£4	6	5
and flax	3	1	0
Showing a difference in favour of oats, per acre, of	£1	5	5

Between the 19th August and 2nd September in 1851, the 5 acres occupied by flax were ploughed, harrowed, sown with white mustard, (½ bushel to the acre, at 6s. per bushel,) harrowed in with 1 cwt. guano, and rolled. On the 23rd October, sheep were put upon 3 acres of this, being about 6 to 8 inches high, the other 2 acres succeeding.

The 5 acres occupied by oats were ploughed on 17th September, and likewise sown with white mustard; but though the plant is not generally very liable to injury by frost, the severe weather experienced in the early part of the past winter has prevented its growth materially, and at no time has there been a good bite for sheep upon it.

The 10 acres will be limed for turnips in March.

I have endeavoured to confine my narrative to the particulars required by the Society, in illustration of the comparative value of flax and other crops; and before proceeding to any remarks upon the various stages of cultivation, and the peculiar management of the former, I would observe, that in this country we may discard altogether any consideration of certain processes, formerly indispensable to the remunerative growth of flax. The tedious, intricate, and hazardous operations of "steeping," "draining," and "grassing," incompatible with the multifarious business of his farm, which demands the attention of the agriculturist here, have been entirely superseded by the system of steeping introduced in Ireland by M. Schenck, and now adopted by Messrs. Clarke, Plummer, & Co., of Newcastle, and Mr Fergus of Prinlaws, Kirkcaldy; while the ulterior preparation of the fibre, (more or less conducted by manual labour, and therefore not unsuited, in the absence of remunerative employment, to the rural population of Ireland, but which, speaking generally, could not in Great Britain profitably become incorporated with the routine labours of the farm,) I mean by "bruising" and "scutching," is likewise more economically perfected by machinery, and on a larger scale.

It is true that the farmer *might* attach steeping-vats and scutching-mills to his steam-engine, and thus manufacture his own lint and codilla for the market, saving possibly a fractional part of the cost, now directly or indirectly borne by him in the preparation of the fibre, and undoubtedly retaining many of those properties which are lost in the steep water and shove.

These, however, after all, are the least important ingredients in the composition of the flax-plant, viewed in relation to their value, as restoratives of fertility abstracted by it; and practically, the ready disposal of their flax-straw, with little trouble, and at a fair profit, would, by 99 per cent. of farmers, be preferred to competition with manufacturers in a field, where experience, and capability, and means, are entirely with the latter.

The great drawback to the profitable export of raw straw is of course its *bulk*, combined with the distance of a market, varying with the locality of the producer. In my own case the freight by railway, a distance (as the crow flies) of about 60 miles, imposes a loss of no less than from 27s. 6d. to 35s. per acre, and it cannot be doubted that, if flax were generally grown, the erection of steeping and scutching mills at convenient intervals, either by manufacturers, or by subscription of agriculturists themselves, would follow. In the mean time, however, even the heavy expenditure attendant upon export of the straw fails to render the crop unremunerative, as compared with other crops in ordinary cultivation; and every diminution of this item of expense enhances the value of flax in the comparison.

On the other hand, the new system of steeping enables us to ripen the seed with certainty—an infinite advantage over the mode usually adopted in

former times, and *of itself* sufficient to justify the antipathy of landowners and farmers to the growth of flax. It is no longer *expedient* to strip off the seed from the plant in its green state; nor is there any inducement, in order to improve the quality of the seed, to allow the plant to grow beyond the time when it is fit for pulling—thus at once unnecessarily impoverishing the soil and deteriorating the quality of fibre. On the contrary, the plant may now be pulled solely with reference to its perfection of fibre; while, after it has been removed from the soil, the seed still continues to draw nutriment from the stalk, and fills and swells and ripens in the stook.

My remarks have been directed solely to the opening created for the culture of flax by the recent improvement in the mode of steeping, and consequent facility for disposal of the straw; not that I undervalue or discredit the possible results of inventions by M. Claussen and others, whereby flax is manufactured, as well alone as in combination with wool, silk, and cotton, without the partial decomposition of its texture by means of fermentation; but I am not personally aware that a market exists, from these sources, for the purchase and sale of raw flax-straw; and though it is obvious that their success would at the same time increase the consumption and improve the price of flax, it is safer to found our calculation upon means and demand, whereon we may rely for a return for our produce.

It will be seen that, in the statement of profit, (1851,) the disposal of the flax-straw in its raw state, at a fixed price per ton, supersedes the process whereby the nett value of the straw was arrived at in 1850.

Messrs. Clarke, Plummer, & Co., (whose extensive business as flax-spinners, combined with the facilities recently acquired by them of steeping and scutching, on their premises in Newcastle, a large annual supply of flax straw, would enable them to consume the produce of many more acres than are at present sown within a limited circuit), have this year made arrangements, whereby, partly by previous inspection of the growing crop, and partly by sample after it has been won and rippled, they readily assign a fair value to the raw straw, to be delivered in Newcastle-on-Tyne; the seller receiving the price of his produce one-third in ten days after delivery, and the other two-thirds at intervals of three months.

A similar proposition was intimated on the part of Messrs. R. M. Craig & Co., of Prestonholm, Dalkeith, at the close of the year 1850, stating their intention, provided they had an assurance that a certain quantity of land would be devoted to the culture of flax for two or three years ensuing, to erect the requisite machinery for steeping and scutching on the best principle, and to such an extent as the wants of the district seem to require. This offer has not hitherto been met by landowners and farmers in such a manner as to justify Messrs. Craig and Co. in fulfilling their conditional pledge. The proposal, however, on their part, proves that an increased production of native flax would be met by increased facility of its vend, while the enormous consumption of the article itself, apparently limited only by the supply, forbids any restraint upon free competition among manufacturers.

I do not understand our present enquiry to include any minute investigation of the theory, that flax scourges and exhausts the land in comparison with other crops; and still less do I propose to enter upon the discussion of the various modes in which the seed may be prepared, or the relative advantage to be derived from its use in feeding stock; but I will conclude this paper by a simple summary of the different stages of cultivation, with such remarks as occur to me to be likely to promote the successful operations of my readers.

1. *Soil.*—The soil best adapted to flax is a strong deep loam, with clay subsoil; but almost any soil of medium quality will bear a good crop, if properly prepared: the exceptions are heavy clay, gravel, sand, and peat.

2. *State of land.*—The land should be in good heart, but not recently manured, (at least with any substance that will not readily become disintegrated by tillage), as otherwise the crop will be uneven; neither must it be too rich, as the flax is thereby rendered too luxuriant, and liable to lodgement before it is fit for pulling. If very poor, it might not be unadvisable to top-dress, before, or at the time of sowing, with guano or liquid manure, either of which would be safer than solid manure, as regards their effect on the equality of crop, and their freedom from the seeds of weeds.

In Belgium, it is not unfrequent to apply rape and other cake, dissolved in urine, at the rate of a 1000 lb. of cake to 2000 gallons per acre, ten days or a fortnight before sowing. The land should be thorough-drained, laid flat, and should *not* have been limed within three years of the flax crop. I am aware that exceptions exist to the universality of the maxim regarding lime; for instance, at Kilfinane, in the county of Limerick, a good crop was one year obtained by Misses Gascoigne, although the land had been thus dressed; but I am inclined to think that some special circumstance or condition of the soil must in such cases attend success.

3. *Rotation.*—The variety of "courses" in which flax has been proposed to be grown, is sufficient evidence that there is some difficulty in selecting that which is best. On the whole, I believe after

lea, or after a grain crop succeeding lea, to be its most suitable place in the rotation.

It ought not to follow potatoes, (though constantly thus in Ireland, on account of the poverty of every other break), turnips, or any root crop which has been highly manured, otherwise the straw will be rank, coarse, and unequal; and, without further experience, I would deprecate its recurrence on the same ground at intervals of less than eight to ten years. At the same time, this precaution is founded as much from observation of the effects of the crop repeated *much more* frequently than once in eight years, as from the opinions of others on the point. It should be followed by turnips, if succeeding a grain crop; or, if after lea, by wheat, oats, or barley; but in either case a stolen crop of white mustard, to be eaten off by sheep, may intervene. Some sow grass seeds along with flax, and undoubtedly the general result is a good take of clover; but, on the other hand, the flax straw becomes discoloured at the root, and is hindered in drying—two evils sufficient to discountenance the practice.

4. *Preparation of the land.*—The main object to be attained is deep cultivation and a fine tilth, perfect pulverisation of the soil to a considerable depth, and freedom from weeds. The roots of flax will accommodate themselves to the state of tillage, and the straw will be in proportionate height to the depth of the root.

The land should be ploughed early in the autumn and laid flat, again ploughed and subsoiled in the spring, and ploughed again if necessary; rolled and harrowed to eradicate all weeds, and reduce the surface to a level.

5. *Seed.*—The seed should be smooth, bright—*rather*, but not *very* plump—of a brownish-red colour, sweet to the taste, and weighing from 52 to 56 lb. per bushel. That usually sown is imported from Riga to Holland—especially the former, if the land be light. English seed, however, raised from Riga seed imported the previous year, is much to be preferred, being cheaper and cleaner, and producing fibre of better quality, than either Dutch or Russian.

My own practice is to sow as much Riga seed in each year as will suffice for the succeeding *flax* crop; bu thome-grown seed may be, without fear, continued another season.

From Riga it is imported in barrels containing 3½ bushels, branded as "sowing seed," to distinguish it from "rejected sowing seed" and "crushing seed." The price is 10s. to 12s. per bushel in this country. It is, however, always exceedingly dirty, containing 2 quarts and upwards of rape, camalina sativa, and other seeds, in the barrel. These should be carefully sifted through perforated zinc, with *round* holes, (twelve to the inch.) This answers much better than the wire gauze in common use, as the squares in the latter are too contracted for the passage of the refuse seeds, whenever their diagonal section is small enough to retain linseed. Dutch seed is imported in old wine-hogsheads containing 7 bushels, but is less to be depended upon than that from Riga. It is, however, more suited to a clay soil than the latter, and costs in this country 11s. or 12s. per bushel.

I have also grown from Sicilian seed flax of good quality; and a considerable quantity is imported from America. The latter, however, is much infested with the seed of the inveterate "flaxdodder," to which the weeds noticed above are harmless in comparison;—the latter merely disfigure the crop, and increase the trouble of weeding—the "dodder" chokes and destroys the flax plant, and, once sown, defies all efforts at eradication during the season.

6. *Time of sowing.*—As early in April as the land can be got into order, and the weather suit—that is to say, in the absence of frost or much wet. If the soil be well prepared, and the land in good condition, the seed will not suffer from drought; but in ill-prepared ground it will not spring without rain; on the other hand, in damp land, it will come up unevenly.

7. *Quantity of seed.*—For *flax* crop, from 2¾ to 3½ bushels per imperial acre may be sown, according to the quality of fibre desired. When an average quantity of seed, and an average quality of fibre are expected, 2¾ bushels will, in most soils, answer the purpose; and the quantity and quality of seed and fibre will vary inversely in proportion to a greater or less amount of seed sown.

For *flax* crop, the seed should invariably be sown *broadcast*, as uniformly as possible; much afterwards depends upon the equality and evenness of the straw, both in height and strength; and hence the objection to ridge-and-furrow, which tend to uneven sowing, uncertain growth, and unequal pulling.

For future *seed*, it is matter of little consequence whether we sow broadcast or in drills, as the object is to obtain a multitude of well-filled capsules at the expense of the quality of fibre; but unless the land be excessively dirty (in which case flax ought not to be sown at all) I see no advantage in the latter mode. The quantity used should be from 1¼ to 1½ bushels per acre.

8. *Weeding.*—When the plant is about three inches in height, and as often afterwards as necessary, the weeds should be hand-picked. In Belgium this is done by women and children, who creep upon all-fours, with coarse clothes round their knees, to prevent injury to the plants. I have rarely found weeding more than once in a season

requisite; and if a dry, breezy day be selected, and the workers (divested of their shoes) face the wind, the plant will speedily recover from the pressure of their feet. Probably in successive weedings more care would be required; but if the weather be at all favourable, few weeds but thistles can rival the rapid growth of flax, which outstrips and smothers all else.

9. *Pulling.*—If any part of the crop be much laid, this should be first pulled, even though not fully ready; and if, unfortunately, from bad sowing, or difference in soil, or any other cause, *portions* of the crop are deficient in length, these should be pulled, and kept apart from the main crop. As soon as one-half, or rather more than one-half, the stem turns yellow, and the leaves fade, and when the fluid in the boll becomes consistent, pulling may safely commence—that which is grown for seed being allowed to stand till the last. In no case must flax be pulled during wet weather.

In pulling, care should be taken to leave any thistles or other weeds which may have grown with the flax, and to keep the handfuls *even* at the root end. These are laid upon a band, formed of two lengths of flax, five or six stalks in each, and a binder ties up the sheaves, which are placed then in small stooks to dry. The sheaves should be rather loosely tied, two-thirds of the length from the root ends, which being spread out, assist the process of drying, at the same time that they defend the stook from being blown over. If this, however, should occur, they ought not to be allowed to lie, as the colour of the fibre will thus be tarnished, and the worms are apt to draw the branches of the plant under ground, and thus defile the straw and seed.

Bands of straw and rushes, and hemp string, are also employed for tying the sheaves; but the flax bands are most easily obtained, and sustain little damage in the usage. It is also customary to set up the flax in "wind-rows," and afterwards in narrow "wind-stacks," before storing or stacking it in bulk; but the ordinary plan adopted with grain crops perfectly answers the purpose, is more easily understood by labourers, and takes less time and trouble than the above, and hence deserves, I think, the preference. Two binders and ten pullers should pull and stook an acre in ten hours.

10. *Stacking.*—In two or three weeks, or longer, according to the weather, when the sheaves are entirely free from damp, inside and out, and the seed has become brown and dry, the crop may be stacked. Logs of wood, and thorns or brambles, should be placed at the bottom, and the stack erected in an oblong square, in such a direction as to catch the prevailing wind on the narrow side of the parallelogram, the roots being laid at the outsides, and each quality of flax, if more than one, carefully distinguished. The stack must be thatched, and examined daily, to insure the discovery of heat, if the flax should "come" again. If heat occur either in stook or stack, they must be taken down, and the sheaves spread out, otherwise the fibre will be irreparably injured. With ordinary care, however, and without extraordinary bad weather, this cannot happen; and in ten days the crop may be considered out of danger, and remain till opportunity arises for separating the seed from the straw. It may be well, however, to examine the stack occasionally, in case it should become infested with mice, which are more destructive to flax than rats.

I have seen much dirt created by these vermin, and much seed destroyed by a small maggot, apparently originating in the fœces and refuse of their nests.

11. *Separation of seed from the straw.*—Various methods are employed to separate the seed from the straw. It was formerly rippled in the green state, (when the straw had to be steeped in ponds), and the bolls dried on shelves, or on the barn floor, or on a cloth in the open air. This, of course, is no longer likely to be adopted. The seed is also sometimes thrashed with a flail, the sheaves remaining tied; but the effect is to entangle the stalks, and to leave a good deal of chaff and seed in the sheaf, thus rendering the straw less marketable, and wasting the seed. Thirdly, the seed is beetled with mallets, while still upon the straw, whereby thrashing and crushing the boll are accomplished at one operation, and the seed merely requires to be put through a winnowing machine to fit it for use. But even this plan, though superior to those already mentioned, leaves the stems encumbered with chaff and green seed, and ravelled in the sheaf, so as to diminish its value to the purchaser. The safest and best way to ensure the production of a sample which will bring its full worth, is to ripple off the seed in nearly the same manner as was formerly practised with the newly-pulled plant—great care being taken to use no unnecessary violence, to the risk of breaking the ends of the stalks when the bolls are stripped off.

A rippling comb costs 15s., and consists of a row of iron teeth, 18 inches long, half an inch square, screwed into a metal plate, which is bolted upon a bench 8½ feet long. The teeth are a quarter of an inch apart at the bottom, and gradually taper upwards till the distance between them is half an inch near the top, whence they are sharpened to a point.

Two men sit upon the bench, one at each end, facing each other, alternately drawing handfuls of flax, (brought to them by women, whose business

is to untie the sheaves as carefully as possible), spread out like a fan, briskly through the rippling-comb once or twice, as may be necessary. The bench is placed on a barn-cloth, to catch the bolls as they are stripped off, and the straw is again carefully tied into bunches or "beats," and carried away. Two men will ripple from 12 to 18 cwt. of straw in ten hours.

12. *Beetling.*—The extraction of the seed from the boll is then obtained either by "beetling" with mallets, as before mentioned, or (which is much quicker and better) by passing the bolls between two smooth metal rollers, set so as to crush the bolls without injury to the seed, after which a common winnowing machine readily separates the latter from the chaff. The same rollers, set more closely together, are used for crushing the seed previous to boiling for food.

We have now gone through the various processes whereby the seed and fibre are prepared for home use or for market, and the chaff and green seed remain for mixing with other ingredients for the use of stock.

Locality and other circumstances will alter in some degree the results detailed in the foregoing narrative, but it is hoped that this has been sufficiently explicit, to enable the practical farmer to judge, whether, in his own case, the culture of flax upon a larger or smaller scale be worthy of experiment.

II.—By James Farquharson, Esq., Craig House, Kincardineshire.

(Premium—The Gold Medal).

The two small farms* to which the following report refers, extend together to 160 acres, are situated close to the Grampian range of mountains, and are separated from each other by a stream, which takes its rise amongst the hills about three miles north-west of the centre of the farms. The altitude above the level of the sea varies from 290 to 350 feet; and although situated ten miles inland, the harvest is frequently not more than from six to ten days later than on the sea cost. The exposure is south and south-eastern; and the climate is peculiarly salubrious, being dry, with rather a high but equable temperature.

Besides being intersected by a stream of water, one of the farms is bounded on the north-east by a burn or rivulet. On the higher grounds the soil is composed of a brown light loam, resting on a gravelly subsoil, and quite dry. The haugh-lands, situated on the banks of the streams already referred to, are composed of alluvial deposits, occasionally interspersed with patches of gravel.

The rotation of cropping followed is termed the six-shift, and is as follows, viz.:—

1st year, Oats, after three-year-old lea.
2d ditto, Turnips, potatoes, and flax.
3d ditto, Wheat, barley, bere, or oats, and sown down with grass seeds,
4th ditto, Grass cut for horses, soiling cattle, and hay.
5th ditto, Pastured with cattle.
6th ditto, Ditto, ditto.

Occasionally the new or first year's grass is pastured, and then cut the second year: this is done principally with the view of procuring good perennial rye-grass seed.

My attention was first directed to the growing of flax in 1843, and since then, with few exceptions, I have had annually a few acres under cultivation; but the notes which I find in my farm-book, regarding the various experiments and processes connected with my flax crops, are somewhat imperfect, with the exception of crop 1849, to which this report more particularly refers.

It, however, having of late years become important to the agriculturist in this country to obtain every possible information relative to flax-growing, I shall state shortly, but as distinctly as I can, my own practical experience in the matter, and at the same time endeavour to convey whatever information I may have obtained elsewhere.

Flax Crop—1843.

Extent.—1 acre 2 roods 20 poles.

Soil.—Deep alluvial, or haugh-land.

Preparations for sowing.—Oats 1842. Stubble turned over in autumn; cross-ploughed in spring; harrowed and weeds collected; deep ploughed, harrowed, and weeds again collected, farther on in the season; rolled, and again ploughed—light furrow; again harrowed and rolled; gave no manure.

Sowing, Weeding, and Pulling.

May 12. Riga seed, 7 bushels—cost £2 11s; covered in about an inch deep with garden rakes, and rolled with hand roller.
May 19. Fine equal braird, and very thick.
June 9. Weeding—most approved method, women and girls crawling along on all fours, with baskets, always facing the wind, so that the plants laid flat may be again assisted to an upright position.
Aug. 26. Two-thirds pulled—being 106 days from sowing to pulling.
Aug. 28. Remaining third pulled.

Watering and Grassing.

Aug. 26. Two-thirds steeped.
Sept. 6. Taken out of pond g been 11 days in retting—an d on grass field.

* Mill of Galloquhine and West Galloquhine belong, the former to the Right Hon. the Earl of Kintore, and the latter to Major Andrew Gammell of Drumtochty.

Oct. 2. Taken off grass—having been 26 days in bleaching.
Sept. 6. Remaining third steeped.
Sept. 22. Taken out of water, and spread on grass field—having been 16 days in retting.
Dec. 1. Taken off grass—having been 60 days in bleaching.

With the view of obtaining a fine quality of flax, the seed was not allowed to come to maturity. The reason of the whole crop not having been put into the water at the same time, was in consequence of the pond having been made too small; and the result of such mistake was, that while two-thirds of the flax first steeped turned out very fair in quality and moderately productive in quantity, the remaining third, by mismanagement and want of experience, was almost wholly lost. The value of the entire produce in clean flax and codilla was £15 12s. 6d.; while with proper management it would have been upwards of £20,

Immediately after the flax was pulled, the land was ploughed, harrowed, and weeds collected, and the manure—24 tons well-made farm-yard dung—which would have been applied to a turnip or other green crop the preceding spring, was now given, along with 20 bolls of lime; and on the 13th September, 16 days after the flax was pulled, I had the ground sown with 6 bushels of wheat. Grass seeds were sown and harrowed in on 8th April 1844; on the 29th June following, the wheat was full in ear; and on the 9th September I reaped an abundant crop, with the young grasses clean and looking well.

Flax Crop—1844.

Extent.—2 acres 2 roods 30 poles.

Soil.—Deep alluvial, or haugh-land.

Preparations for sowing.—Oats 1843. Ploughing and all other operations exactly the same as those for the flax crop of the previous year.

Sowing, &c.

May 9. 10 bushels Riga seed.
May 23. Weeding.
Aug. 30. Pulled—113 days on ground.
Aug. 31. Steeped.
Sept. 18. Taken out of water, and spread on grass field—having been 18 days in retting.
Oct. 2. Taken off grass—having been 14 days in bleaching,

This was a very fair crop, and pretty well managed up to the rolling and scutching operations; but in these there was evidently a want both of improved machinery and skill in handling the flax. The following statement will show the additional cost of this flax crop, compared with that of one of turnips, and the relative value of the produce:—

Ploughing, and all other operations connected with the cleaning of the land, up to the time of sowing, being the same as for a turnip crop, no charge falls to be stated,				£0	0	0
10 bushels Riga linseed,	£4	0	0			
Less value of turnip seed for 2 acres, 2 roods, 30 poles.	0	5	6			
				3	14	6
Extra labour in sowing, raking in, and hand-rolling, beyond that of a turnip crop				0	5	0
Expense of weeding, same as hoeing, &c., of turnips				0	0	0
Pulling—24 women 1 day, at 8d. each				0	16	0
Carrying and putting into pond—6 men and 4 horses 1 day				1	0	0
Taking out of water and spreading on grass				1	2	6
Taking off grass, and stacking				0	19	0
Scutching—15 cwt. flax, at 10s. per cwt.				7	10	0
Extra costs of flax crop				£15	7	0
PRODUCE.						
15 cwt. of clean flax, at 40s. per cwt.	£30	0	0			
1 cwt. 14 lb. of fine codilla, at 20s. per cwt.	1	2	6			
4 cwt. of coarse ditto, at 2s. 6d. per cwt.	0	10	0			
				31	12	6
Leaving				£16	5	6
to meet rent and expenses of ploughing, &c.; and the ordinary value of turnips in this part of the country being from £3 to £4 per acre, when consumed on the farm, take the highest of these rates—say 2 acres 2 roods 30 poles, at £4 per acre, amounts to				10	15	0
Leaving				£5	10	6

in favour of a flax compared with that of a turnip crop; and had the seed of the flax been saved, the difference would have been increased to £15, or £5 11s. 7½d. per acre, while at the same time manure would have been produced, by feeding cattle with the seed and chaff, equivalent, or nearly so, to that from a turnip crop.

After the flax was pulled and removed from the ground, the system followed last autumn was again pursued, and with equal success. The manure which would have gone to the turnip crop the previous spring was now applied, together with a quantity of lime; and within seven days from the time the flax was pulled, the same small field was sown with wheat. On the 7th April following the grass seeds were sown and harrowed in, on 12th July the wheat was full in ear, and on 23rd September it was cut down, and turned out an excellent crop.

1845.

Had no flax sown this season.

Flax Crop—1846.

Extent.—2 acres 10 poles.

Soil.—Light loam, with gravelly subsoil, incumbent on strata of red sandstone.

Preparation.—Oats 1845. Ground prepared as in former years.

Sowing, &c.

May 16. 4½ bushels of old Riga seed cost 32s., and 1 bushel new Dutch seed cost 15s.
July 2. Partly in bloom, and from 12 to 18 inches in length in 47 days from date of sowing.
July 11. Full in bloom, and very beautiful—56 days.
Aug. 24. Pulled, having been only *three months and eight days* from time of sowing until the date of pulling.

The seed was allowed to ripen, and, when rippled and cleaned, weight 54½ lb. per bushel, and sold for 57s. 6d. per quarter. The flax was only retted the following summer, and the amount and value of the produce turned out similar to crop 1844.

Flax Crop—1847.

Extent.—3 acres 19 poles.

Soil.—Almost none—subsoil a poor, hungry, red clay, nearly as hard as rock.

Preparation.—Ploughed from the *heather*, on the side of the Grampians, in 1846, and sown with oats. Poor crop of corn; and being close to an extensive game cover, what was of it was devoured by hares and rabbits,

Sowing, &c.

May 14. 3 bushels Riga seed, and 3 bushels of my own, being part of the seed saved from last year's crop.

July 10. Not looking well.

Aug. 25. Pulled and rippled.

This crop turned out much better than anticipated from appearances in the month of July, and, to a certain extent, proves that the flax plant will grow almost in any soil, or, as in the present instance, almost without a soil at all. My motive for sowing flax in such a situation, and on such a piece of ground, was, that if it did not grow I would not lose much, having given no manure, and, if it did grow, I was sure that the crop (flax) would not be eaten up by vermin; while, on the other hand, I was well aware that, although I had manured the land, and succeeded in getting a crop of turnips, I would have had little trouble in carrying them home.

The value of the seed, bolls, and flax, amounted to £13 9s. 4d.

After an autumn and a spring ploughing, but without giving any manure, I had this piece of reclaimed moor sown, on the 5th of April 1848, with rye and grass seeds, and reaped but an indifferent crop on the 8th September following.

Flax Crop—1848.

Extent.—1 acre 3 roods 11 poles.

Soil.—Low lying, deep, alluvial haugh-land.

Preparation.—Operations similar to former years.

Sowing, &c.

May 6. 3½ bushels fine Riga sowing seed.
July 26. In bloom, and partly beginning to boll.
Aug. 28. Pulled—3 months and 22 days from date of sowing.

The cold, wet ungenial weather during the latter end of June, and nearly the whole of the month of July, prevented the flax being weeded until too far advanced in the season, and consequently the work was not only ill performed, but the plant was slightly injured by being trampled upon when too long.

The several processes of pulling, rippling, retting, bleaching, and milling, were all gone about as in previous years; but having consumed both seed and chaff in the feeding of my own cattle, an exact account was not kept, and I cannot, therefore, state the value of this flax crop. I may, however, observe that adjoining the flax on the same field were several acres of swedish turnips, and that the flax land, after being thoroughly cleaned the following spring, but without being manured, except a dressing of lime from a gas-work, was sown, on the 12th of May, with Chester bere and grass seeds, and that an equal quantity of the turnip land was also sown down at the same time, and with the same kind of seed; and, farther, that from the date of sowing until the time of reaping, no perceptible difference whatever was observable between the crop on the flax land and that after the swedish turnips---the produce in grain of both divisions being, as near as may be, the same.

Flax and Potato Crops—1849.

The field to which the following remarks more particularly refer measures 12¾ acres, is a light loam, with gravelly subsoil, incumbent on the red sandstone formation, quite dry, and what in the district is generally termed a sharp early soil. The crop on this field in 1848 was oats after lea; and in 1849, 5 acres were planted with potatoes, 5 acres sown with flax, and the remaining 2¾ acres with swedish turnips.

I may remark that, in growing flax, I have always considered it as a green crop, and treated it as such, with this difference, that in place of giving the usual manure allowed for a turnip or potato crop, I preferred reserving it for the wheat or barley crops the following season; and so little do I approve of manuring flax, that had it not been expressly desired that each portion of the field on which the experiment was to be made should be treated exactly alike, I certainly would rather have followed the system I had adopted in former years,

After properly cleaning the land, and reducing it to a fine mould, I never once failed in quickly getting a strong healthy plant; and although a quantity of good manure might still have made it stronger, it would at the same time have tended very much to encourage the growth of weeds, the small seeds of which it is difficult wholly to get rid of. If flax was sown in drills the same as turnips, the case would then be different, as the weeds could be kept down in the usual way, by repeated hand and horse hoeing; but, with a broadcast flax crop, one weeding is all that can be got done;---and if the weather should happen to be wet, even that one weeding may not be overtaken in time.

Another reason I have for not giving manure to the flax crop is, that immediately after the flax is pulled the ground requires to be stirred with the plough and harrowed, the broken-down flax and weeds collected and removed from the field; and in these operations it is impossible to avoid exposing to the atmosphere part of the unexhausted manures. The dates of the several ploughings and other operations connected with the flax and potato crops, as well as the cost of production, the relative value of produce, and the nett profit derived from each of the five-acre divisions, will be found minutely detailed in the following statements.

FLAX.

No. I.---Statement of Rent, Cost of Cultivation, and Value of Produce of Five Acres of Flax, 1849.

1849.	*Dr.*		
Jan. 1.	Rent of land, £1 10s. per acre	£7 10	0
3.	Ploughing from stubble, 7s. per acre	1 15	0
Mar.19.	Cross ploughing, 7s. per acre	1 15	0
23.	Harrowing, weeds collecting, and carting off from field, 5s. per acre	1 5	0
Apr.27.	Deep ploughing, 7s. per acre	1 15	0
30.	Harrowing, weeds collecting, and carting off from field, 4s. per acre	1 0	0
May 8.	84 loads good well made farmyard manure, weighing 17 cwt. 14 lb. each load=to 71 tons 18 cwt. 2 qrs., (or full 14 tons per acre,) which at 4s. per ton, amounts to £14 7s. 8d., and of this sum one-third falls to be charged against the present crop	4 15	10
,,	Carting manure and spreading on surface, 3s. 6d. per acre ..	0 17	6
,,	Ploughing down manure, 7s. per acre	1 15	0
9.	Smoothing with garden rakes, and again collecting weeds ..	0 8	0
10.	12 bushels Riga linseed, 56 lb. per bushel, at 7s. 6d. per bushel ..	4 10	0
,,	Sowing, covering in with garden rakes, and hand-rolling ..	0 12	0
June 30.	Weeding 4½ days of 9 women, at 8d. per day each, £1 7s., and 1 man 4½ days, at 2s. per day, 9s.	£1 16	0
Sept. 3.	Pulling, 5 women and 1 man 4 days each	1 1	4
8.	Binding and stooking, 5 women and 1 man, 2 days ..	0 10	3
28.	Carting to mill barn, and thrashing	1 9	4
,,	Stacking and thatching ..	0 12	6
1850.			
July 17.	Watering and grassing ..	4 10	0
,,	Carting to watering pond fifteen miles, and a like distance of the flax home from scutching mill	1 5	0
1851.			
Mar.29.	Miling 20 cwt. 0 qrs. 21 lb. of flax, at 10s. per cwt. ..	10 1	10
	Total cost ..	£49 5	0

1849.	*Cr.* Produce.		
Nov. 3.	Flax bolls, after being bruised, 117 bush., at 9d. per bushel ..	£4 7	9
,,	41¾ bushels seed, at 7s. per bushel ..	14 12	3
1851.			
Apr. 15.	20 cwt. 0 qrs. 21 lb. clean flax, at 48s. per cwt.	48 9	0
,,	1 cwt. 3 qrs. 22 lb. fine codilla, at 18s. ..	1 15	1
,,	11 cwt. 2 qrs. 24 lb. coarse codilla, at 3s. ..	1 15	2
		70 19	3
	Nett profit ..	£21 14	3

Or at the rate of £4 6s. 10d. per acre.

POTATOES.

No. II.---Statement of Rent, Cost of Cultivation, and Value of Produce of Five Acres of Potatoes, 1849.

1849.	*Dr.*		
Jan. 1.	Rent of land, £1 10s. per acre	£7 10	0
3.	Ploughing from stubble, 7s. per acre	1 15	0
Mar.19.	Cross-ploughing, 7s. per acre	1 15	0
23.	Harrowing, weeds collecting, and carting off from field, 5s. per acre	1 5	0
Apr.27.	Deep-ploughing, 7s. per acre..	1 15	0
30.	Harrowing, weeds collecting, and carting off from field, 4s. per acre..	1 0	0
May 1.	Opening drills, 5s. per acre ..	1 5	0
3.	84 loads good well made farmyard manure, weighing 17 cwt. 14 lb. each load=to 71 tons 18 cwt. 2 qrs., (or full fourteen tons per acre,) which at 4s. per ton, amounts to £14 7s. 8d. ---and of this sum, one-third falls to be charged against the present crop	4 15	10
May 3.	Carting manure and spreading in drills, 3s. 6d. per acre ..	0 17	6
,,	3 tons 15 cwt. seed potatoes, Irish cups, at 80s. per ton ..	15 0	0
,,	Picking and cutting, large sets, 2s. per acre	0 10	0

May 3.	Planting, 2s. per acre ..	£0	10	0
„	Closing drills, 5s. per acre ..	1	5	0
June21.	Horse-hoeing, 2s. per acre ..	0	10	0
22.	Hand-hoeing, 3s. 3d. per acre	0	16	3
23.	Earthing up drills with plough, 2s. per acre	0	10	3
July 8.	Horse-hoeing, 2s. per acre ..	0	10	0
10.	Hand-hoeing, 2s. 3d. per acre	0	11	3
14.	Earthing up drills with plough, 3s. 6d. per acre	0	17	6
Oct. 13.	Taking up and storing on the field in long narrow bins, and covering with earth, 11s. 6d. per acre ..	2	17	6
1850.				
April 8.	Taking out of bins, picking for market, and delivering, 21 tons 7 cwt. 3 qrs., at 2s. 1d. per ton ..	2	4	6
	Total cost	£48	0	4

1850.	*Cr.* Produce.				
April 8.	21 tons 7 cwt. 3 qrs. potatoes, full market size, at 52s. per ton ..	£55	12	2	
„	4 tons 9 cwt. 2 qrs., undersized potatoes, at 36s. per ton	8	1	1	
				63	13 3
	Nett profit			£15	12 11

Or at the rate of £3 2s. 7d. per acre.

It has already been incidentally observed that the flax plant will grow almost in any soil; at the same time, it is well known that a deep, moderately rich loam, with a porous subsoil, not wet, but inclined to damp, is the most suitable. The field to which the details in the preceding tables refer, would, at one period, and when flax was cultivated to a greater extent in the locality than now, have been considered altogether unsuitable; but although the crop was by no means a heavy one, still it was moderately good; and had the value been contrasted with that of a turnip in place of a potato crop, or with the value of a potato crop previous to the great failure of that root in 1846, the result would have been widely different. Instead of 52s. per ton, the current rate for potatoes then ranged from 24s. to 40s. per ton, the latter price being considered much more remunerative than the growing of turnips.

Against the flax there is also the charge of carrying the straw a distance of fifteen miles for the purpose of being watered, and of bringing back the clean flax and codilla a like distance of fifteen miles from the scutching-mill. Farther, in looking at the relative value of the produce, the great risk now attending the growing of potatoes, compared with flax, must be kept in view; and, should the risk happily decrease, or cease altogether, then the value of that esculent will, as a natural consequence, become depreciated. Had the potatoes, in place of 52s., only sold for 32s. per ton---that being a very common rate in this part of the country previous to 1846---then, in place of a profit on that crop, there would actually have been a very considerable loss. But, on the other hand, it may be observed that the cost of the seed potatoes---80s. per ton---was very high, and that the crop, about five tons per acre, was comparatively a light one. There was no disease, but the shaws or stems, while green and luxuriant, began to decay on the 10th of September, and within five days became quite black, and the growth of the tuber was consequently checked, or rather stopped, altogether.

The pulling of the flax occupied from the 3d to the 8th of September; and the binding in small sheaves and setting-up, or stooking, required two days more. On the 28th of September it was carted to the thrashing-mill barn; but in place of rippling by the hand, the thrashing-machine was applied, which not only did the work effectually, but much more expeditiously, and at a considerable less cost. The sheaves were not put through the mill, but merely held so as to allow the beaters on the drum to strike off the bolls, and then withdrawn---the feeding rollers having previously been taken out of gear. After thrashing, the flax was carefully handled, and then stacked out until the following summer, when it was retted, bleached, and scutched in the usual way.

After the flax was carried, that part of the field on which it grew was ploughed and harrowed, the weeds and short broken-down straw collected and carted off. In the spring following, on the 13th of March, the whole field was ploughed, and seven days thereafter it was sown with Scotch barley. Very wet weather succeeded; and it was not until the 12th of April that grass seeds could be put in. The barley was then so fully rooted that it was not considered advisable to attempt to cover in the grass seeds in the usual way; and as a substitute for harrowing, a piece of a small larch tree was mounted with furze, and drawn over the field, and then rolled. During the whole season not the slightest difference in the several divisions of the field could be discerned on the barley crop; in fact, it would have been impossible for the most experienced judge to have pointed out where the potato crop left off and the flax crop began, or where the flax left off and the swedish turnips commenced. The produce, four quarters two bushels per acre, was uniform over the field; and although the acreage quantity was small, the quality was very superior, weighing 56½ lb. per bushel, and carried the first prize last spring at the Royal Northern Agricultural Society's show of seeds at Aberdeen.

Had the manure, however, which was given to the flax been reserved and applied to the barley,

that part of the field would no doubt have been superior to the other divisions, while the flax crop would have been equally good, or nearly so, without manure.

The young grasses, the following spring and summer, were the finest and most luxuriant ever seen on the farms, and attracted the attention of every one who passed the field. The general belief was, that an extra quantity of seed must have been sown to produce such a flush of grass, but which certainly was not the case; the whole quantity allowed being only 12 bushels perennial rye-grass, 34 lb. of red, and 23 lb. of white clover seeds, for 12¼ acres; or at the rate of 1 bushel of rye-grass, and not quite 5 lb. of clover seeds, per acre.

To the many inquiries made regarding the process followed, and the quantities of seed sown, the short but simple reply was, that the seeds, more by accident than anything else, had been only *slightly covered*, in place of being *buried*. As stated throughout this report, and it may be repeated here, the *garden rake*—the brush-harrow would do equally well---was invariably used for covering in the flax seeds; and, in the opinion of the writer, rye-grass and clover, as well as flax and other small seeds, ought not to be put deeper in the soil than an inch, or even less.

The covering in the seed of five acres with rakes, and afterwards rolling the ground by manual labour, may appear somewhat paradoxical to the notions entertained regarding the economy of modern husbandry; but on referring to statement No. I., it will be found that the whole cost of these operations ---sowing, raking, and rolling---was only twelve shillings, or at the rate of 2s. 5d. per acre; and provided wages for seven men for one day, six of them at 1s. 8d. each, and one at 2s. The same amount of money would only have paid for a man and a pair of horses for one day and six hours, at the usual charge of 7s. 6d. per day.

In the rotation, as noted at the beginning of this report, one crop of oats is taken after three-year-old lea, then flax, and after it either wheat, barley, or bere, sown down with grass seeds; but had the soil and climate of the farms been suitable, wheat would in all cases have been preferred to any of the other cereals. The flax plant, being of rapid growth, gives ample space in the spring months to have the ground well cleaned and prepared; and although it may be desirable to have the seed sown in the beginning or middle of April, the first or second week of May is not too late. When sown about the beginning of May, and the seed allowed to come to maturity—and there seems to be no good reason why it should not always be ripened and saved---the flax generally is ready for pulling by the end of August, or at least in the first week of September; thus affording plenty of time, after removing the flax from the ground, for the several operations of ploughing, cleaning, manuring, ploughing in manure, and then sowing with wheat, all by the middle or towards the end of September; and, consequently, giving the wheat after flax a very considerable advantage over the same crop when sown later on in the season after potatoes or turnips.

Flax should always be considered a green crop, and grown on part of the fallow break, so as not to interfere with the regular rotation, or lessen the usual quantity of fodder on the farm. The seed and bolls being used for feeding cattle, become a substitute for the turnip or potato crop displaced by that of the flax, and when so used, keep up the fertility of the soil equally with any other kind of green crop.

Linseed feeding is also a very valuable auxiliary, when the turnip crop happens in any way to be deficient, or even when it is abundant. The plan I have hitherto adopted is, to commence with eight ounces of linseed meal per day for an ox of forty-five to fifty stones weight, gradually increasing the allowance to twelve ounces, and finishing with one pound. In preparing the mash, we occasionally boil turnips; but the water is always allowed to come to the boil before putting in the linseed meal. After letting the whole simmer for about ten minutes, it is ladled into large tubs over layers of barley or oat chaff, and each layer, as it is put in, is beaten down with a small rammer. The compound requires twenty four hours to cool, and is then given in quantities of about a stable pailful to each animal at one p.m., and again after the turnip feed at five p.m. A small quantity of flax chaff or bolls, boiled and mixed with other chaff or cut straw, makes excellent and nutritious food, either for stalled cattle or milk cows. To the horses we give the linseed ground, the same as for cattle; but only a few ounces at a time, mixed with bruised oats, and steeped in cold water.

In concluding this report, it may be remarked, that flax was grown more extensively in Scotland towards the end of last and beginning of the present century than now. The value of the fibre was then much greater; but being cultivated almost wholly for the purposes of home manufacture and home use, very little note was taken of the cost of the raw material. It was after the introduction of machinery, in 1795, for the spinning of linen yarns, and which, in the course of twenty years, almost entirely superseded spinning by hand, that the culture of flax began to decrease. During that period —from 1795 to 1815—grain and cattle had also attained very high prices, which was another cause why the farmer became less anxious about growing flax. But now that the value of corn as well as of

cattle has become so much depreciated, and, without some great exciting cause, will evidently be permanently depreciated, it becomes a question of importance whether the growing of flax, as part of the rotation on the farm, may not be beneficially practised.

In the north of Ireland, principally in the Province of Ulster, flax-culture is carried to a very considerable extent, and, under the auspices and fostering care of the Royal Flax Improvement Society, is now extending to the southern provinces. Last season the Irish farmers had almost 140,000 acres under cultivation; but to supply the wants of the United Kingdom, 600,000 acres would not be too much.

The soil and climate, in various parts of England and Ireland, may be slightly superior to that of Scotland for the culture of flax; but it has, nevertheless, been clearly shown, by the statements in the preceding pages, that flax may be profitably cultivated in Scotland, and that, too, without deteriorating the fertility of the soil, or in any way disarranging the regular rotation of the farm.

Estimating the arable land in Great Britain and Ireland at 48,000,000 acres, and were only 1¼ acres in every 100 acres sown with flax, the produce would be 120,000 tons of flax, besides codilla, 4,800,000 bushels of linseed, and 14,400,000 bushels of chaff--representing a value of £6,500,000; and of this sum at least £4,500,000 would be expended solely in labour.

The great desiderata, at the present time, in the growing of flax in this country, are ponds for steeping, and scutching-mills for dressing the flax. Along with the improvements by draining, the old *lint-pots*, as a natural consequence, have disappeared, and the scutching-mills, one after another, with very few exceptions, have gradually fallen into decay.

These wants, however, are likely soon to be supplied—the former by the introduction of the late Mr. Schenck's patent hot-water system of retting, and the latter by various recent improvements in scutching machinery. In Ireland, there are now eighteen patent steeping establishments in operation. The Messrs. Marshall of Leeds, Mr. Fergus of Strathore in Fifeshire, and the Messrs. Baxter, Dundee, are also all making trial of the new steeping system. Should it succeed—and, so far as it has yet been tried, there appears to be no reason to suppose that it will not---the growing of flax, and the preparation of the fibre, would then become two distinct and separate employments. The farmer would merely have to grow the flax, take off the seed, and sell the straw. In this way, flax-culture might be easily and profitably carried to a great extent, giving remunerative employment to a large number of the population, and at the same time not causing the smallest decrease of the produce required for the sustenance of the people.

III.---By Mr. Walter Reid, Drem, East Lothian.

[Premium---The Gold Medal.]

Public attention has been of late much directed to the subject of flax, and its extended culture has been advocated as being more remunerative to the agriculturist than the crops generally grown, from the prices of the latter having (in the mean time at least) very considerably declined; while, from the increasing demand for the former, its value is being gradually enhanced.

In Scotland, its cultivation and preparation, for the uses of the manufacturer, are almost unknown to the present generation of farmers. It is, however, no new branch of agriculture, as is shown by the following extract from a work entitled *A General View of East Lothian*, by George Buchan Hepburn, Esq., of Smeaton, published in 1794 :---

In the year 1727, the Board for the Encouragement of Manufactures and Fisheries was instituted; and as the culture of flax was altogether unknown at that period, the Board had a certain number of surveyors instructed in the culture of flax, to each of whom they assigned a district of country, and by bounties they invited the husbandmen of each district to cultivate the plant under the direction of these surveyors, who superintended the business from the time of sowing the seed, till the flax was watered and prepared for scutching.

Mr. Spalding, one of those surveyors, who had charge of this county, invented the water-machine now (1794) used for the scutching of flax, and under his direction the Board erected the first machine of the kind ever known in Great Britain at Gifford Mill, on the Tweeddale estate, in this county.

It may also be mentioned that to Mr. Cockburn of Ormiston, known as an agricultural improver, belongs the honour of having erected the first bleachfield in Scotland at the village of that name; and the first commercial undertaking of the British Linen Company was at Salton, also in East Lothian, instituted in 1750 by Andrew Fletcher of Salton, Lord Justice Clerk, a nephew of the patriot, and first deputy-governor of that Company.*

In 1746, flax received great attention from the then Society for the Improvement of Agriculture; and the bounties given by the Board of Trustees were continued till within the last twenty years.

* According to three years' average, ending with the year 1790, there were of linen made for sale in Haddingtonshire 26,875 yards, which were valued at £1866 4s. 2d. sterling. According to the same average, ending with 1800, there were 27,221 yards, of the value of £1766 5s. 6d. sterling.

Notwithstanding this encouragement, its cultivation gradually decreased. The high price of grain at the beginning of the present century contributed much to this result. Times have, however, changed; new and improved processes have been discovered for manufacturing the fibre, while the value of the seed for feeding purposes has become better known. This has re-directed attention to the subject. In Ireland, within these few years, its cultivation has made very considerable advances —the increase in the number of statute acres sown being 47,579 in 1851 over 1850. Brighter prospects have been augured for that unhappy country, from the impetus it is expected to give to its manufactures, and employment to its starving population.

In the spring of 1850, the following experiments were commenced, in order to ascertain whether it would be a paying crop in such a district as East Lothian. Some information, it is hoped, may be gleaned from a detailed account of it by those who purpose to engage in its cultivation, while some of the errors (unavoidable, perhaps) in a first experiment may serve as a beacon to be avoided. For the trial a piece of ground was selected containing 10 imperial acres, lying in a low and rather damp situation, about 40 to 50 feet only above the level of the sea, and at about 4 miles' distance from it. The soil may be characterised as an alluvial clay, with a mixture of moss containing under water, but tile-drained as deeply as practicable. It had been previously managed in the six-course rotation. The crop immediately preceding was grass, and was cut for soiling. To compensate for this, towards the end of autum turnips and oil cake were eaten on the ground by sheep, It was ploughed in winter, and in March half of the ground was sown with oats, the crop for which the whole was intended. The other 5 acres, reserved for the flax, were reduced to a fine mould by means of the harrow and roller. After being rolled flat, they were sown on the 5th of April with Riga linseed, at the rate of 10 pecks to the imperial acre. The seed was covered with the ordinary grass-seed harrow, though some sort of bush harrow would have been preferable, as those seeds which were nearest the surface germinated first. After the plant was about three inches high, it was carefully hand-weeded.* About the beginning of August it was pulled, a slight yellowness of the straw giving indications of its becoming ripe. It was tied into sheaves about 8 or 9 inches in diameter, stooked in the same way as corn, and allowed to stand while dry enough to be carried to the stackyard. In the course of the winter it was divested of its seed, which was done by beating it out upon the barn-floor. The seed was cleaned by the ordinary winnowing machine; the straw was re-stacked, and stood till sent to be scutched. The whole expense and produce of both crops were as follows:—

EXPENSE OF OATS PER IMPERIAL ACRE.

Ploughing, harrowing, and sowing ..	£0	12	6
Seed, 4 bushels at 2s. 6d.	0	10	0
Reaping	0	8	0
Carrying to stackyard	0	4	0
Thrashing, &c.	0	9	0
	£2	3	6

PRODUCE OF OAT CROP.

6 quarters at 18s...	£5	8	0
171 stones straw at 4d.	2	17	0
	£8	5	0
Deduct expenses	2	3	6
Profit ..	£6	1	6

EXPENSE OF FLAX CROP PER IMPERIAL ACRE.

Ploughing	£0	9	0
Harrowing, rolling, and sowing ..	0	7	0
Cost of seed	2	1	4
Hand weeding	0	7	1½
Pulling	0	11	8½
Carrying to stackyard	0	3	0
Thrashing and cleaning seed ..	1	0	0
	£4	19	2

PRODUCE OF FLAX CROP.

18 bushels of seed at 9s.	£8	2	0
32 cwt. of straw, as valued by Mr. Fergus's manager at £2 per ton..	3	4	0
90 bushels of bolls, at 2d. per bushel	0	15	0
	£12	1	0
Deduct expenses	4	19	2
	£7	1	10
Deduct profit of oats	6	1	6
Leaving ..	£1	0	4

in favour of the flax crop.

The seed may appear high at 9s. per bushel, but part of it was sold for sowing. In April last a statement something similar to the above was laid before a meeting of the Haddington Club. The following remarks were made upon it by Messrs. Bernard and Koch of Creeganh, near Belfast, the proprietors of Schenck's patent steeping process, and which appeared at the time in the *North British Agricalturist*:—

That this crop must have been grown principally

* "In Scotland, a crop of flax, it is said, has been sometimes weeded by turning a flock of sheep at large into the field.. They will not taste the young flax plants, but they will carefully search for the weeds, which they devour."—*Loudon's Encyclopædia of Agriculture.*

with a view to a large crop of seed—and we suspect the flax straw to be coarse and branchy; as in all experience we have never known so large a proportion of seed to the weight of straw, when the latter is such as it should be—that is, of moderate thickness, perfectly free from branches, straight, and not too thin towards the point. The largest proportion of clean seed we have ever known to the weight of straw is 8 bushels to each ton of straw (after seeding), or about 6 bushels to a ton weighed off the field in a dry state. We have to remark, also, that the cost of seed for sowing should be at most £1 10s., instead of £2 1s. 4d. It should even be only 25s. (that is, 2½ bushels at 10s.) In 1850, flax seed sold at an extraordinary price, reaching 14s. or 15s. per bushel; but a farmer, having every year a crop of flax, benefits equally under such circumstances, as his proportion of seed fit for sowing is proportionally increased in value. Another overstated item as regards expense, is the cost of thrashing and cleaning the seed. No doubt it has cost £1 per acre in this instance, there not being proper implements; but with a seeding-machine and a dressing-machine, fitted expressly for the purpose, the cost is under 6d. per bushel of cleaned seed. On 18 bushels, the cost should then stand at 9s., instead of 20s.

Without venturing to speak decidedly as to how far the above remarks are correct, there can be no doubt but a large crop of seed must, to a certain extent, injure the fineness of the fibre; and seeing its value varies from £30 to £100 per ton and upwards, it must be a matter of calculation, only to be obtained after repeated trial, how far the one object ought to be sacrificed for the other. Instead of Mr. Fergus's offer of £2 per ton for the thrashed straw being accepted, which, after deducting the cost of carriage, was less than its value for making manure, it was sent to the factory lately erected by him near Kirkaldy, for the purpose of steeping flax under Schenck's hot-water process.

Mr. Wilson, the manager there, kindly undertook some experiments with it. The straw, amounting to 6 tons, was divided into four parcels, and each was steeped under a different method. No. 1 was retted on the old plan, in cold water; No. 2 in hot water; No. 3 in cold and then in hot water; and No. 4 twice in hot water. The loss in weight, after being steeped twice in hot, was 5 per cent. above that steeped in cold water alone. This slight loss, however, is far more than compensated by its increased yield. After being scutched, No. 1 yielded 7.90 per cent. of dressed flax; No. 2, 9.20; No. 3, 12.29; and No. 4, 12.96,—or very nearly double that done in cold water. Their values were respectively £34, £35, £38, and £45 per ton.

The following table was supplied by Mr. Wilson:—

Received of straw,						Produce			
tons	6	15	3	0	tons	6	11	1	4
Waste, 3.3 per cent,					or	0	3	1	24
Received for vats,									
tons	1	9	0	18—once retting cold		1	3	1	2
	1	18	1	14— „ hot		1	9	1	27
	1	9	0	0—twice cold & hot		1	2	0	25
	1	14	3	0—twice hot & hot		1	6	2	27

Loss on once cold 20.2 per cent.
Do. on once hot .. 23.1 „
Do. on twice cold and hot .. .. 23.3 „
Do on twice hot and hot .. .. 25.0 „

ONCE COLD.

Received for scutching					Produce			
tons	1	3	1	2	tons	0	1	3	12

Flax yield, 7.90 per cent.

ONCE HOT.

tons	1	9	1	27	tons	0	2	2	24

Flax yield, 9.20 per cent.

TWICE COLD AND COLD

tons	1	2	0	25	tons	0	2	2	6

Flax yield, 12.29 per cent.

TWICE HOT AND HOT.

tons	1	6	2	27	tons	0	3	1	24

Flax yield, 12.96 per cent.

Total tow—ton 0 2 2 20.
Yield, 2.6 per cent.

On looking at this, one cannot help being struck with the superiority of Schenck's process over the old plan of retting in cold water. The increased and constant temperature of from 80 deg. to 90 deg. imparts a softness to the fibre, and a fineness to the colour, which, in some instances, increases the value of the one over the other as much as sixty per cent.

The whole produce of this flax crop, after the above experiments were completed, amounted to £21 11s. 8d., while Mr. Fergus's account for steeping and scutching amounted to £21 14s. 8d.; so that I lost not only the whole straw, but 3s. besides. Had the straw, however, been prepared according to plan No. 4—namely, twice in hot water—its value would have been something near what Mr. Wilson put upon it.

After the flax and oats were removed from the ground in the autumn of 1840, the part on which the flax was grown appeared considerably cleaner than the other. At this time the whole received twenty-five cart-loads of farmyard manure per acre. In spring it was drilled up in the ordinary manner for beans, which were sown at the rate of four bushels per acre. During summer, the greater luxuriance of those upon the flax ground could be seen at a very considerable distance. They are now thrashed, and the results will probably surprise those who consider flax as an exhausting crop. The produce and value per imperial acre are as follows:—

From the ground after Oats.

3 quarters 1 bushel, weighing 63½ lb. per bushel, at 30s. 6d. per qr.	£5	4	3¾
161 stones straw, at 4d.	2	13	8
	7	17	11¾

From the ground after Flax.

3 quarters 7 bushels, weighing 64¼ lb. per bushel, at 32s. per qr. ..	6	4	0
217 stones straw, at 4d.	3	12	4
	9	16	4
Difference of value in favour of the crop after flax	£1	18	4¼

The beans were sold in Haddington market, and brought the prices attached to them. Few will be inclined to value the straw under 4d. a stone: many attach a higher value to it, which would make the contrast still greater.

In districts where the turnip husbandry can be fully carried out, ample employment can generally be found for the whole of the agricultural population. The weeding of the flax would interfere with the operations connected with this crop. Under such circumstances, its cultivation ought to be entered into with caution. There are situations, however, where the case is very different; and when it is kept in view that the expenses of raising flax, such as weeding, pulling, and arranging it for the different processes, preparatory to its being manufactured, far exceed that of any other crop, its adoption there may perhaps be more strongly recommended, giving employment of a less laborious nature than the ordinary operations of the farm. As, even in this instance, had the straw been sold, a small profit would have been obtained, surely, in less favoured districts, the erection of such works as Mr. Fergus's, and the growth of an article which the country imports, in flax seed and oilcakes, to the extent of between seven and eight millions annually, are objects deserving every encouragement and support.

AGRICULTURAL BIOGRAPHY.

(Continued from page 310).

XXXVII.—Ray, 1662.

John Ray, or Wray, was born at Black Notley, near Braintree, in Essex, on November 29, 1628. He was begun in education at Braintree School, and removed to Trinity College, Cambridge, where he was chosen Greek Lecturer, Mathematical Lecturer, and Humanity Reader, and acquired much reputation in languages, polite literature, and the sciences. His favourite study, and what constituted the chief business of his life, was the history of nature, and the works of God. In order to promote the study of botany, he published in 1660 the "Catalogue of the Cambridge Plants;" and the reception of the work encouraged his proceeding. In 1670 he published his "Catalogue of the English Plants." After various sojournings of abode, he retired to his native place of Black Notley, where he died in January, 1705, in the seventy-seventh year of his age. He published various works on natural history, in physiological botany, insects, and molluscous animals. His botanical works, or "Methodus Plantarum Nova," and "Historia Plantarum," led the way to the systematic construction of botany, and laid the foundation of British arrangements. The essays on sap, leaves, and roots, published separately, were very valuable. Ray published several theological works, and "Three Physico-Theological Discourses, concerning the Chaos, Deluge, and Dissolution of the World," 1692, 8vo. The author was ever noted for preaching solid and useful divinity, instead of the enthusiastic stuff which the sermons of that time were generally filled with. Natural history sobered his fancy.

Ray is always very deservedly included in the lists of authors who have benefited the general department of natural philosophy, of which agriculture is a part. His labours were most valuable in relation to plants and animals, which two branches form a large connection with the cultivation of the earth. An indirect bearing has often produced much greater results than an unscientific application, which wanted the soundness of base that must be derived from the preconceived theory. Ray did not prescribe any way or mode of better cultivation of the soil; but he illustrated the articles which are the fruits of culture, and thereby embellished the art in the most important parts of its constitution. His name is ever mentioned as a very eminent philosopher and natural historian.

XXXVIII.—Atwell, 1662.

George Atwell wrote "The Faithful Surveyor, discovering divers errors in land-measuring," Camb. folio, 1662. The book contains 143 pages of quarto size, and is bound in a volume of surveying, dated 1682. "Norden's Dialogue" is included. Attwell was a teacher of mathematics at Cambridge; recommends the measuring of land by the chain only, and introduces a new instru-

ment, called a Pandorini, to supplant the plane-table, theodolite, and quadrant circumferentor, and any other observing instrument. The matter is very scientifically handled; and of all the writers on surveying of land up to this date, the author seems to have been the most complete master of the subject, and to have seen it most clearly.

XXXIX.—Dugdale, 1662.

Sir William Dugdale, an eminent English antiquary and historian, was the only son of John Dugdale, of Shirtoke, near Coleshill, in Warwickshire, gent., and born there September 12, 1605. He received the usual grammar-school education at Coventry, and lived with his father, who initiated him into the study of antiquities. His position in society pushed him into the acquaintance of Hatton and Spelman, who procured for him an appointment and residence in the Herald's Office. He was very diligent in studying and copying the antiquities that came within his reach; and being removed to Oxford, a further opportunity was afforded him of pursuing his occupation. He compounded his estate with the victorious party against the king, and returned to London. He laboured most assiduously with Dodsworth in collecting and methodizing the materials of his great work, "Monasticon Anglicanum," which appeared in 1665, and the third volume in 1673. Many eminent men were engaged in this work, and great additions were subsequently made to it by Sir John Stephens, gent. "The antiquities of Warwickshire" was printed at the author's charge, and while it was being done, the materials were collected for "The History of St. Paul's Cathedral, in London," 1668, folio. Upon the Restoration, Dugdale was made Norrey King at Arms; and in 1662 he published "The history of imbanking and draining of divers fens and marshes both in foreign parts, and in this kingdom, and of the improvements thereby, extracted from records, manuscripts, and other authentic testimonies," adorned with sundry maps, &c. The author completed the second volume of "Sir Henry Spelman's Councils" by the instigation of Archbishop Sheldon and Lord Clarendon. He followed with several other works, as "Origines Judiciales," and "The baronage of England." "A short view of the late troubles in England," and his last work, "A perfect copy of all the summons of the nobility to the great councils and parliaments of this realm from the 49th of King Henry III. until these present times," 1685, folio. He was Garter Principal King at Arms, and received the honour of knighthood, much against his will on account of the smallness of his estate. Dugdale died in 1686, in the eighty-first year of his age, and was interred at Shirtoke, in a little vault of his own plan and erection. His posterity yet live in the county of Warwick.

The history of embanking and draining was written at the request of Lord Gorges, Sir John Manham, and others, who were adventurers in draining the great level in the counties of Cambridge, Huntingdon, Northampton, Norfolk, and Suffolk. Ten short chapters are devoted to the account of the ancient embankments and water channels, from the first records of the ancient Egyptians to the earliest notice of such performances in Britain, where maps are delineated in order to show the grounds and the channels that were directed. The Romney Marsh is first described and mapped, and said to be the work of the Romans, in the recovery from inundation by the sea. East Kent follows in the trench of Northbroke to Sandwich, and the marshes of Monketone and Menstre. Then come the marshes on the borders of the river Thames, from London to Greenwich, and to the mouth of the estuary. The low grounds in Surrey are then described, as about Bermondsey and Southwark. Then follow Middlesex and Essex, Shadwell and Stebenhethe; the marshes in the suburbs of London—in Bishopsgate, Finsbury, and Cripplegate. The low grounds around the mouth of the river Lea are then mentioned, and followed by the marshes in the county of Sussex, as at Pychandesbroke and Kechenbaune, and elsewhere. Somersetshire is next travelled into, and the marshes below Wells and Glastonbury are particularized. A map is given of Sedgemoor and the adjacent places. The low grounds are mentioned between Bristol and Gloucester, that lie along the banks of the Severne. From Gloucestershire the author jumps into Yorkshire, and finds the marshes near the rivers Ouse, Trent, and Humber. Holderness is reached, and the low grounds towards Hull and the sea-coast of the Humber, and between that river and Lambflete. Something is noticed in Derbyshire, near the rivers Derwent and Trent. Lincolnshire is then reached, which contains the great fennes, which fill the remaining part of the book. The part of the marshes in each county has a separate notice, and maps accompany each division of fens that is described. The whole volume fills 424 folio pages.

Dugdale does not advance any opinion of the works that had been done; nor does he state any better system that might have been, or could be yet adopted. He merely relates the institution of the proceedings, the appointment of commissions, the powers granted, and the results obtained. In these views, no more useful book had ever appeared.

XL.—Strangehopes, 1662.

Samuel Strangehopes wrote "Book of know-

ledge, in three parts—concerning astrology, physic, and husbandry," London, 1662, octavo. This notice occurs in the "Bibliotheca Britannica," but is not found in any other catalogue of books and authors. The loss may not be any way regretted, as the connection in the title does not betoken any intelligence on practical agriculture, but only some mention of it along with physic and astrology.

XLI.—Yarranton, 1663.

Andrew Yarranton, of Ashley, in the county of Worcester, gent., wrote "The great improvement of lands by clover," London, octavo, 1663; "England's improvement by sea and land—to outdo the Dutch without fighting—to pay debts without money—to set to work all the poor in England with the growth of our own lands—to prevent unnecessary suits in law, with the benefit of a voluntary register—directions where vast quantities of timber may be had for the building of ships, with the advantages of making the great rivers of England navigable—rules to prevent fires in London, and other great cities, with directions how the several companies of handicraftsmen in London may always have cheap bread," in two parts. London, 1677, quarto. Recommends the extension of agriculture.

The work on clover fills 46 pages of small duodecimo; and the contents are:—

1. The reason why some that have used clover have not found profit by it.
2. Clover doth not impoverish, but improves the land.
3. What are the fittest lands to sow clover upon?
4. The profit that is to be raised by this husbandry.
5. When, how much, and how to sow clover-seed.
6. Directions for mowing, making, and using the hay.
7. What cattle are fittest to graze it with.
8. The author's readiness to give any man further satisfaction, and to prove the truth of what he affirmeth by visible experiments.
9. Where the seed that is good and new may be had.

The author ascribes the failure in growing clovers to the very just cause of ignorance in the management, the unprepared state of the ground, and too little seed being sown. He avers that clover improves land by the corruption of superfluous parts of the plant, by the root cleaving the soil, and by the shade of the leaves beneath which the moisture is retained, and an incipient decomposition is encouraged, which mellows the surface of the ground, and provides food for future crops. These opinions have not been yet superseded. The author thinks dry gravelly lands are not agreeable to the clover plant, especially if it has been well limed before. He reckons six acres of clover, equal to thirty acres of natural grass in the maintenance of cattle. He urges the use of lime to encourage clover, and reckons £3 per acre to be the worth of clover to graze or mow. The month of March is recommended for the sowing of clover, that the plants may be rooted before the drought catch it, and the quantity in 12lbs. The author had sown clover without grain in April and August, and preferred the latter month. It is sown by hand, like corn. The hay is made as now-a-days, by turning the swathes gently, and not shaking out; and it is recommended to mix the ricks of damp clovers with barley and oaten straw, which will make good fodder. Clover lands, after being mown, are much benefited by being watered for the second crop, if the application be possible. Clover is good food for all grazing animals; cattle are cautiously put to eat it, in short spaces of time, for three following days. Horses are introduced to it without danger; and also swine at any time of the year. Geese and turkeys are also fed upon clover. Drilling and hoeing of the plant is mentioned, but not strenuously advocated. The author names the shops of seeds where the sound article can be got.

This little work is the most truly practical matter that had appeared in the agricultural world to the time when it was written. It is divested of all extrinsic and adventitious notices, with which the writers of those times swelled their works, and rendered them very perplexed and unintelligible. It contains more value in 46 pages than in many hundreds of contemporary publications.

"England's improvement by sea and land" forms a small quarto volume of 212 pages, of which the contents have been already mentioned in quoting the work. The improvements are done by general means, as digging canals, making rivers navigable, making roads, and the encouragement of fisheries by erecting fishing cities, to be free of all taxes, customs, and imports. Maps are given containing designs of the cities through which canals carry ships to any part of the towns. Illustrations are always given of the author's suggestions.

Of himself, he says, he was apprentice to a linen-draper when King Charles II. was born, and continued some years in the trade; but the shop being too narrow and short for his large mind, he took leave of his master, and said nothing. He lived a country life for some years, was a soldier in the late wars, and had the honour and misfortune to lodge and dislodge an army. In the year 1652

he entered upon some iron-works, and plied for several years. He surveyed and made navigable the three great rivers of England; studied the great weakness of lands that are constantly cropped, and found the reason of its defection by practick and theorick, and applied the remedy by putting out the book on improvements by clover, by which very much land has been doubled in value. He entreats every opposition to his projects to be sent him, when he will take care that a civil answer shall be returned; and among the heads put forth for discussion with the person who finds the fault is one—how to employ six thousand young lawyers and three thousand priests, for the good of the public and of mankind, who now have neither practice nor cure of souls. The writer only stated the point, but did not discuss it—a matter of regret, as to have read his disposal of what he thought a useless incubus on society, would be both curious and entertaining. He maintains that he presents his readers with facts, or what with much ease may be made facts, and entreats that no hastiness of judgment be allowed to condemn his proposals, till the subject be well weighed in all the points and bearing.

Nothing is known beyond the above notice of his own writing, of the lineage, social existence, and employed life of Andrew Yarranton, who seems to have been a person of very extensive views, and an enlarged comprehension.

XLII.—Forster, 1664.

John Forster, gent., wrote "England's happiness increased, or a sure remedy against all succeeding dear years, by a plantation of roots called potatoes." The book is dedicated to Charles II., and the author dates from Harslop, in Bucks. Directions are given in 30 octavo pages how to make with potatoes, bread, paste, puddings, custards, cheesecakes, and cakes. Then follow the utilities of potatoes in six divisions, and an appendix touching the propagation of potatoes by seeds of the apple. The first utility goes to the king, who may derive a revenue of £50,000 yearly, by making plantations of potatoes. The second utility is the transportation of corn, which will be saved from home consumption by the use of potatoes. The third utility arises from the cheapness of corn by the use of potatoes. The fourth utility maintains the poor families cheaply. The fifth utility supports cheaply the poor of the parishes. The sixth and last utility is the general use of the root among all sorts of people. The author directs the berries of the potato to be gathered in October, set into the ground, and will that year yield roots, which are again planted in the usual way. Forster wrote very sensibly.

XLIII.—Dodson, 1665.

Colonel William Dodson wrote "The design for the perfect draining of the great level of the fens, called Bedford Level, as it was delivered to the honourable corporation for the draining of the said great level, 4th June, 1664." The book fills 40 pages of medium quarto, and a map is made to show the proposed channels to carry away the waters, and prevent the hurtful stagnation. The estimated cost is £28,000. It is not known what attention the author received of his design; or if he was ever employed in any execution of it: his name does not appear in any other place or occasion.

XLIV.—Worlidge, 1669.

Little is known of the history of John Worlidge or Woolridge, of Petersfield, Hampshire. He wrote several works on agriculture, gardening, and on bees, of which the chief are the "Systema Agriculturæ," the mystery of husbandry discerned and laid open, 1669, '77, '81, folio; 1687, 1716, 8vo. Treatise on husbandry, 1675, folio. The complete system of husbandry and gardening forms, an 8vo. volume of 504 pages, 278 folio, in 15 chapters as follows:—Of husbandry and improvements in general; of the great benefits and advantages of enclosing lands; of meadow and pasture lands; of arable lands and tillage; of manuring, dunging, and soiling of land; of the benefit in raising, planting, and propagating all sorts of timber trees; of fruit trees; of tillage of herbs in gardens, and roots, and fruits; of beasts, fowls, and insects; of injuries to the husbandman; of instruments, tools, and engines; of fowling, and fishing; Kalendarium Rusticum, or monthly directions to the farmer; prognosticks of the weather; dictionary of rustic terms.

This book contains much more useful and enlightened observations than any which had previously appeared. The author warmly recommended clover, lucerne, sainfoin, and ray grass, in the first notice of the plant, and seems to have been well acquainted with the irrigation of meadows, where his directions are very practical and sensible. He knew the value of chalk on sandy lands, and of ashes to sour pastures. He suggests the drilling of corn, and delineated a machine for the purpose, and also to deposit along with the seed any fine matters that will be manures, to promote vegetation. He differs from modern practice, in dropping the manure above the seed, in place of underneath the grains. The seed of grain crops is advised to be often changed from different aspects, and to steep corn in brines of nitre and salt and in urine, and prescribes a steep of sheep's dung, half bushel, saltpetre ½lb., common salt 1lb., boiled together for ten minutes in twenty quarts of water. He favoured

the paring and burning of lands, and felt the value of earthy manures, and considered that calcareous sands are useful as litter for cow sheds and sheep cots.

The value of the excrements of fowls and pigeons is raised very high, and also of bones of every kind. Peat, sawdust and tanner's refuse, are to be mixed with dung-heaps—a practice not yet fully used. Woolridge says, "The well preparing of dung mixed is a piece of husbandry not to be slighted, on which point of good or ill-husbandry depends the rise or fall of the rents or values of many farms in this kingdom.

The writers of those days were farthest behind in the knowledge of animals. Points of quality or symmetry had not any existence among them, and when any mention happens to be made, the commendations are precisely what are now avoided. Large bones and lowness of paunch were objects of merit in those times, when beeving had obtained little notice, and random observations directed the practice of breeding animals. But at that time the advantages did not exist which favoured the modern breeders of cattle; green crops were unknown, and the demands of consumption had not begun to operate. The views of Worlidge on trees and plantations were much more enlightened, and he ridicules the objection of making orchards, that the fruit would be stolen; so land must not be improved nor any thing done, or the clergy would claim the tenth part of the produce. The nine parts must be wanted because the tenth would go away.

Of ploughs, the author mentions the double-wheeled, or Hertfordshire plough, the turn-wrest or Kent plough, "which surpasseth for weight and clumsiness," the one-wheeled plough, the plain-plough, and the trenching-plough.

Worledge took a scientific view of agriculture, and very correctly in the philosophy of its own art, and not in connection with any accessory science, with which the consorting of it may be difficult, if not wholly impossible. The philosophy he propounds is, no doubt, very exposed to many grave and serious blunders, which must be charged to the times, and not to the man who seems to have entertained ideas that were much in advance of his age. His mind was not cleared of the mystical universal spirit, or spirit of mercury and salt, which, with similar ideas, had infested the thoughts of every writer on physical subjects. But with all its faults, the book is undoubtedly a very wide step in the advancement of agriculture, and shows the rapid progress of reformations of every kind.

XLV.—Blagrave, 1669.

Weston has stated that Samuel Blagrave wrote the Epitome of Husbandry, in 12mo., London, 1669; and some others say it was written by Billingsby. No author of either name has got a book of that title attached to it in neither of the libraries of the British Museum, or in the Bibliotheca Britannica. The name is here entered on the sole authority of Weston.

XLVI.—Smith, 1670.

John Smith, Gent., wrote England's Improvements Revived by Husbandry and Trade, in six books; of several ways of improving all sorts of waste and barren grounds, with the seeds and plants that thrive best therein; the planting of timber trees and underwoods, and for gardens and orchard, the kitchen garden, and physic herbs. Also the new way of ordering cattle, sheep, cows, deer, conies, fowles, bees, pigeons, fish, and aviaries. Many remarks never before given. The work is dedicated to Lord Browker, the first President of the Royal Society, and the M.S. had been submitted to several members of the society for their opinion; among others to Evelyn, who sent the author the following letter in reply,—

"Mr. Smith,—I have perused your accurate treatise, entitled, England's Improvements Revived, and find it so industriously performed, and in so useful a method, that I cannot but cheerfully give my approbation. I have myself been engaged in the same argument, by command from the Royal Society, which has now been some time at the printer's, towards a second edition; and shall therein not fail to publish due encomiums of your work before it comes abroad. For though in some particulars we may happen to treat the same subject, yet it is without the least prejudice to each other, and I am glad to find my own conceptions fortified by a person of so great a talent and experience beyond me. Cedat ergo in bonum publicum.

"J. Evelyn."

"Saye's Court, 10 Feb., 1668."

The book was published by the expense of subscribers, and contains 270 pages of medium quarto. The matter is very miscellaneous, and most subjects are very passingly treated. Sheep and cattle have short notices; a cow must yield at least four gallons of milk every day, and have a fresh pasture every week. The author's attention was chiefly occupied with trees, as were most writers of these times. The work is hardly an agricultural book, but is always mentioned in the list of rural writers, and so is here included.

XLVII.—Reeve, 1670.

Gabriel Reeve of Hackney, wrote, "Directions left by a gentleman to his sons, for the improvement of barren and heathy lands in England and Wales."

The author says he had practised husbandry for thirty years, and had improved much land; and then went into Brabant and Flanders, where he saw a new lesson to be learned. He mentions largely clover and turnips, and Devonshiring (paring and burning) of land, which was done for £1 an acre. Clay, loam, and marl, are recommended as manures, and to plough deeply, and to dung well. The author seems to have known fully the practice of agriculture as done in his time, and gives us the benefits of the clover and turnip cultivation. The essay forms part of a volume of agricultural tracts, some of which have the author's names, and others are anonymous.

XLVIII.—Pettus, 1671.

Weston has related that "Sir John Pettus" wrote "Saint Foine improved," in 4to, and in 1674. He mentions another work, "History, laws, and places, of the chief mines and mineral works in England, Wales, &c.," in folio. This last work, and others on different subjects, by Sir John Pettus, are found in the "Bibliotheca Britannica" and the library of the British Museum; but the first-mentioned work on Sainfoin is nowhere discovered. Pettus wrote much on mines and metallurgy; and also on politico-theology. He had been a person of some standing in society; though a doubt may be expressed if the work on sainfoin had been his production, as no other authority is found to corroborate the statement of Weston.

XLIX.—A Person Lately Deceased, 1674.

This assumed name as an author wrote "St. Foine improved: a discourse showing the utility and benefit which England hath and may receive by the grasse called St. Foine; and answering to objections urged against it." London, 4to, 1674. This work occupies twenty pages of the small quarto size, explaining the great merits of the grass, the soils most favourable for its growth, and the cultivation which it requires. Modern experience could not at this day give any better directions in the use of sainfoin, which seems to have been as well known in those times as at the present day.

L.—J. B. Gent, 1675.

This name wrote "The epitome of the art of husbandry," comprising all necessary directions for the improvements of it, viz.: plowing, sowing, grafting, gardening, ordering of flowers, herbs; directions for the use of the angle; ordering of bees; together with the gentleman's heroick exercise; discoursing of horses, their nature and use, with their diseases and remedies; of oxen, cows, calves, sheep, hogs, with the manner of ordering them, their diseases, and remedies.

Of the nature of marle; the best way of planting clover grass, hops, saffron, liquorice, hemp, &c.

To which is annexed, by way of an appendix, a new method of planting fruit trees, and improving of an orchard, with directions for taking, ordering, teaching, and curing of singing-birds, and other useful additions. London, 12mo, 1675.

This work fills 136 pages of 12mo size, and is said to have been twice printed previous to this date, though no notice appears of the fact. The matter is arranged in short chapters or notices, and very confused, without any relation to precedence or connection. The author's ideas of animals are very fair, and show his experience to have been practical, and beyond an amateurship. Like to the books of the day, much irrelevant matter is coupled with every subject that is introduced. A considerable advance of time was required to rid this propensity.

The author says, a good horse hath several properties: two of a man, two of a badger, four of a lion, nine of an ox, nine of a hare, nine of a fox, nine of an ass, eight of a woman.

The two properties of a man are: a proud heart and to be bold and hardy.

The two of a badger are: a white ball on the forehead and a white foot.

The four properties of a lion are: a broad breast, stiff neck, wild countenance, and good legs.

The nine properties of an ox are: broad rib, short brawn, short pastern, great sinews, wide challes, great nose, big chine, fat and well fed, and of upright standing.

The nine properties from a hare are: stiff-eared, great eyes, round eyes, lean head, lean knees, light of foot, short buttocks, good fillets, and to turn upon light ground.

The nine properties from a fox are: prick-eared, little-eared, round-sided, side-tailed, short-legged, black-legged, short-trotting, well coloured, a little head.

The nine properties from an ass are: small-mouthed, long-veined, thin-crested, straight-backed, small stones, lath-legged, round-footed, hollow-footed, a rough foot.

The eight properties from a woman are: merry at meat, well faced, broad forehead, broad buttocks, busy with the tongue, chewing the bridle, good at a long journey, hard of ward.

If this description be not anatomically scientific, it is at least original, and most peculiarly appropriate.

LI.—Sherley, 1676.

Sherley is stated by Weston to have written "Curiosities of Scurry grass," with cuts, in 8vo. No book of that title can be found under the name of Sherley in the "Bibliotheca Britannica," or in

the libraries of the British Museum. The name is here entered on the sole authority of Weston.

LII.—Langford, 1681.

"Systema agriculturæ," being the mystery of husbandry discovered—London, 1681, folio—is ascribed to "J. Langford" as the author by the "Bibliotheca Britannica." Weston writes him as the author of "On fruit trees," in 1696, but does not mention the agricultural work; and no library in the British Museum possesses it, but they have the work on trees. The name is here entered on the authority of the "Bibliotheca Britannica," which may have mistakingly attached to the name of Longford the exact title of Worlidge's production. Such inadvertencies have not unfrequently happened.

LIII.—Firmin, 1681.

Thomas Firmin was born at Ipswich, in Suffolk, in 1632; died in 1697. He was a noted person for public benefactions and charities, and published an essay of 24 quarto pages, entitled "Some proposals for the employing of the poor, and for the prevention of begging—a practice so dishonourable to the nation and to the Christian religion." London, 1678, 1681. The author had built a house in Aldersgate-street, where the poor people received flax and spun it, when they got the wages of employment; and he recommended that work be afforded to the people in their own homes, which is ever to be preferred to large congregations in public workhouses. He allows public receptacles where to curb and employ vagrants and sturdy beggars who have no habitation, and who would not preserve one in cleanliness were it provided them till the necessary habits be taught and confirmed. He advises schools for poor children, to be taught to work and to earn their own living. He thinks it quite practicable that work be found for all capable persons, and that there is no occasion for any person to be scant of bread. The author's views were sufficiently benevolent, but not very enlarged.

LIV.—Houghton, 1681.

John Houghton, F.R.S., published "A collection of letters for the improvement of husbandry and trade," London, 1681, 4to. "Collections for the improvement of husbandry relating to corn; a catalogue of all sorts of earths; the art of draining, of brewing; the instruments of husbandry." Revised by Bradley, 1727-28, 4 vols., 8vo. The first work only is found in the British Museum, and is a volume of 360 quarto pages, in two divisions, which are bound together. The letters relate to various subjects, and were written by eminent persons, Evelyn and Worlidge included. The author writes the preface from St. Bartholomew-lane, behind the Royal Exchange, and gives a catalogue of the books relating to agriculture in the library of the Royal Society. None of the practical works are mentioned which we have noticed in our biography. The author excuses his miscellaneous assemblage of matter, and likes a libertine way of handling subjects before the severest rules.

The letters are enquiries concerning agriculture; advantages from enclosures; great advantages from the clover grass; cure of neat's tongues in London; great gain made from cole seed; some considerations about trade.

The matter and use of money; great gain from French furzes; an account of Thomas Firmin's book: "Proposals for employing the poor;" remedies against the loss of crops, smuts, mildews, lodgings of corn, and its being eaten up by birds; plantations of foreign colonies do not depopulate, but rather increase or improve our people; new way of curing smuttiness in corn; some account of the plague; Spain not prejudiced by its plantations; prodigality, or men spending their estates doth not prejudice the nation; about improving land by marle; high living enriches the nation, instead of prejudicing it.

The history of malting; a description of the malt kiln; concerning several matters that relate to the argument. A defence of the prohibition of Irish cattle, in two long letters, with a cure of woodcocks into an excellent dish; proposals concerning the linen manufactory; an account of making bread, and of a great improvement of land by parsley; on lives, East India Company, and bankers; account of exports and imports in 1682; account of improving and fining of cyder; a statement of a new way of ploughing; an experiment on salt; an essay on wood as fuel; a relation of the culture, planting, and ordering of saffron; account of great improvement of mossy land, by burning and liming it; enquiries concerning husbandry and trade; it is for the interest of the people that kings be plentifully supplied; the culture of safflower; how to rear cattle, fatten calves and lambs; the manner of making bricks; how to make colonies of bees; manufactures thrive best when provisions are dear, as plenty encourages business.

Houghton makes the first notice of the potato plant as an agricultural vegetable, and calls it "a bacciferous herb, with esculent roots, bearing winged leaves and belled flowers." The field cultivation of the plant began about the time when Houghton wrote, or from 1680 to 1690.

These letters, collected and published by Houghton, have always enjoyed a very considerable reputation, and it would seem very deservedly. The

author had been an educated person, and had enjoyed the correspondence of the *virtuosos* of his time. His ideas of improving trade would not now find an admittance.

LV.—Lambert, 1683.

James Lambert wrote "The countryman's treasure, showing the nature, cause, and cure of all diseases of cattle," London, 1676-83, 8vo. This treatise occupies 52 pages of 24mo, and has on the front page the portraits of an ox, sheep, and pig, being the veriest caricatures that can be imagined of these animals. Weston quotes "John Lambert."

"The countryman's treasure; or, a treatise of oxen, sheep, hogs, and dogs," in 12mo. It is hard to say if the persons had been the same, or were different authors on separate subjects. The work now quoted is a veterinary production rather than agricultural; but "Lambert" is generally written as an agricultural author, and the uncertainty remains if the writer had been a farrier or a farmer.

LVI.—Godfridus, 1688.

This name is attached to a book of 124 pages of 24mo, entitled "The knowledge of things unknown, showing the effects of the planets and other constellations; together with the husbandman's practice and the shepherd's prognostication." The appellation may be an assumed title, as no initial letters have ever been affixed to it, and is written "Compiled by Godfridus, supra palladium de agricultura Anglicarum." The heading of the chapters is in common type, and the contents are in the old English characters. The prognostications of the weather from astrological observations do not now attract any notice, and this book does not contain any practical matter.

LVII.—Moore, 1695.

Sir Jonas Moore, Knight, F.R.S., was a very respectable mathematician, and Surveyor General of His Majesty's Ordnance; born in Lancashire in 1617, died in 1679. He wrote several mathematical works, and "History or narrative of the great level of the fens, called Bedford Level," with a large map of the said level, as drained, surveyed, and described, 1685, 8vo.; also, "England's interest, or the gentleman's and farmer's friend," London, 1706, 12mo. This last work contains 188 pages of duodecimo, and treats "How land may be improved from 20s. to £8, and so to £100 per acre yearly, with great ease, and for an inconsiderable charge. The best and quickest way of making a nursery. How to make cider and fruit wines, and brew malt liquors of all kinds. Of the great benefit from the husbandry of bees. Instructions for fish-ponds, and for angling and catching all kinds of fish. Physics for families in every distemper."

The author discusses the first proposition in nine pages, and arrives at his conclusion by means of apples and fruits converted into wines and cyder. His pen met no obstruction on the paper; but the fruits are exposed to many influences.

The "History of the great level" occupies 67 pages of 24mo, and relates the proceedings of draining and the allotment of the recovered lands. The map does not appear with the book, and the work seems unworthy the author's reputation.

LVIII.—Bellers, 1696.

John Bellers wrote "Proposals for raising a college of industry for all useful trades, and of husbandry," London, 1696, 4to; and "General essays concerning the poor." The first work fills 28 pages of 4to size, and is dedicated to the Lord Chief Justice Hale, that great composition of learning and virtue, and the contents are: Reasons for providing for the poor; the way shown of doing it in a college fellowship; proposals to the college founders; advantages to the founders, and rich by it; some advantages to the poor collegians; some rules about governing the college workmen; of the education of children; an answer to several objections; a postscript.

The author was induced by the cries and miseries of some, and idleness and lewdness of others, of the poor, to suggest some proposals for relief, which were presented to the Lords and Commons assembled in Parliament. Three things are proposed: first, profit for the rich (which will be life to the rest); secondly, a plentiful living to the poor without difficulty; thirdly, a good education for youth that may tend to prepare their souls into the nature of the good ground. Labour, not money, is to be the standard of every value, all cheats and robberies being done by means of money, or the great mammon of unrighteousness. Three hundred persons are in one college, and at £10 for each person's labour, the income will be £3,000 yearly. The sum of £10,000 is allowed to buy an estate of land, £2,000 to stock it, £3,000 to prepare the necessaries of work, £3,000 for a new building, or repairing an old one—in all £18,000. The stock to be valued every year, and the profits divided. No subscription less than £25. Every £50 or £100 to have a vote; and no person to have more than five votes. Twelve proprietors to form an inspecting committee. The governors, or under officers, to have no salary, but only a maintenance in the college. No corporeal corrections, but abatements of food—a dismissal the last resort—and the house of correction must be distant.

Other regulations are subjoined, which show a very sound undertaking.

The author answers objections as to the difficulty of performance, that all great doings would never have been acted on the same ground of difficulty, and concludes that, to remove all objections that may be urged against such purposes, would be to empty the sea.

The author refuses the name of workhouse as bespeaking too much of servitude, and bridewell implies punishment, which should not exist upon earth; and the term community understands more unity of spirit than ever may be found among the human race. A college implies a general utility without any compulsion or servitude of any kind.

The author of this essay does not stand alone in thinking that the Government of every country has the power and the means of making an adequate provision for the whole population, and that a bounden duty exists that it be done. The ideas of men had made a most rapid progress in Britain from the reformation in religion, and the commencement of the civil commotions to the times in which we write—bigotry had fled, and liberality succeeded in its place.

LIX.—Mather, 1696.

William Mather was a surveyor of highways in Bedford, and wrote "Of repairing and mending the highways," in five sections, touching: I. Removing obstructions in the highways and scouring the ditches next adjoining. II. Draining the highways. III. Providing material. IV. Providing labourers. V. Providing carriages. Published for the use and instruction of young surveyors. The essay occupies 32 duodecimo pages, and relates chiefly to the duties of surveyors, and less to the practical formation of roads. It is bound in a volume along with other short dissertations on various subjects.

LX.—Meager, 1697.

Leonard Meager wrote two works on gardening, and "Mystery of husbandry," London, 1697, 12mo. Nothing is known of his life, or social existence. The work on husbandry contains 161 pages of duodecimo, in 61 chapters, of improved arable, pasture, and woodland. This book being reckoned among the best agricultural works, the contents are subjoined at length:

Introduction. Of the excellency, necessity, and usefulness of the advancement of good husbandry.

Chapter.

1. How to know the goodness of land.
2. Of the dunging of ground.
3. The nature, use, and benefit of marle.
4. Of ploughing, the parts of the plough, and best season for ploughing.
5. Of liming, sanding, and hacking land, to make it fruitful.
6. Of the first and second ploughing and of harrowing.
7. Of weeding and destroying the weeds, with directions to order the corn in sowing, &c.
8. To dress and manure barren ground overrun with goss, broom, furze, weeds, &c., relating to ground dry and wet.
9. To improve barren clay, simple or compound, overrun with whinney, with the particular ordering of it.
10. To dress and manure all barren clays, simple or compound, incumbered or overgrown with heath or ling.
11. Of dressing, ordering, tilling, and manuring barren sandy ground, producing only short mossy grass.
12. Of ordering and dressing barren sand, overrun with fern, heath, brakes, and the nature of the soil, &c.
13. Of ordering and enriching barren lands subject to wild briars, twitches, and bushes, &c.
14. Of ordering, tilling, and enriching barren lands encumbered with moors, or moorish long grass.
15. A way in general to enrich any poor sand or clay for grain with less trouble and cost than before.
16. To reduce grounds to fertility that have been spoiled by salt-water, or overflowings of sea-beaches.
17. Good pasture and meadow to be made of barren soil of any of sort or earth, simple or mixed.
18. Several useful engines described for the watering of meadows, pasture, &c.
19. Further rules and directions for watering meadow and pasture for the improving and fertilizing of it.
20. The proper way effectually to drain land and reduce it to fertility, either arable or pasture.
21. To drain fenny and marshy land with the least charge, and most effectually, &c.
22. Tools and instruments proper and useful in the working part, and order of draining land, &c.
23. The best way to improve drained fen lands to great advantage, &c.
24. Discovery of abuses in ploughing, and how to order them.
25. A description of the most necessary sorts of ploughs used for tillage in England.
26. A computation of work to be done by one man in one day in the sundry occupations relating to husbandry.
27. The variation of soil in the several counties requires different measures to be taken in agriculture, &c.
28. What is required in husbandry in order to oxen and horses, for tilling of lands variously situate, &c.
29. Proper things to be observed and done

Chapter.

throughout the twelve months in the year.

30. Utensils and tools necessary for the husbandman for arable land, the barn, stable, meadows, and pastures, &c.
31. To preserve your grain when sown from all sorts of vermin, who are apt to destroy or annoy it.
32. To prevent smuttiness in corn, preserve it against blasts, the injury of black frosts, snow water, mists, and how it is to be ordered when reaped wet.
33. Proper directions for the stacking of corn, to keep it from vermin, fowl, taking wet, or musting.
34. To know washed corn, and how to lay up and keep to the best advantage all useful sorts of grain in granaries, &c.
35. The best way to plant and order vines to a great increase and improvement of land.
36. How to order hop-vines, gather and dry hops, after the best manner, &c.
37. Flax and hemp good improvers of land. How to manure the ground for them, and sow and order them.
38. To order hemp and flax, when ripe, to the best advantage.
39. How to plant and order saffron for the improvement of land, &c.
40. Clover, or clover grass: how in the best manner to order the seed, sow, and increase it, for the improvement of land.
41. St. Foin, or French grass: directions for sowing, ordering, and improving it on land.
42. Improvement of land by sowing and well ordering of turnips.
43. Improvement of land by sowing of carrots, and how to well order them, &c.
44. Improvement of land by sowing of parsneps, and the well ordering them.
45. Improvement of land by sowing weld, or weald, and how to order it.
46. Improvement of land by sowing of woad, and how to order it.
47. Improvement of land by sowing madder, and how to order it.
48. Woodland and inclosures improved, and the great advantages made thereby.
49. Of oak, elm, and beech: how to order and improve them for the best advantage.
50. Of ash, walnut, and chestnut trees, &c.: their improvement and well ordering.
51. Of the maple, horn-beam, quick-beam, hazle, box, juniper, holly, and fir trees: how to order and improve them.
52. Of trees delighting in wet ground, as the poplar, aspen tree, alder, willow, &c.: their ordering, and the best way to improve them.
53. Further improvements for ordering sundry sorts of trees for the valuable improvement of land.
54. How to order trees for their better growing, and more speedily turning to good advantage.

Chapter.

55. Sundry trees not yet mentioned: their growth and well ordering for the improvement of land.
56. Of trees fitting for timber and other uses; the sundry sorts, their goodness, and to what uses properly to be attributed—very necessary to be known.
57. A true recipe how to make the best bird-lime.
58. Wonderful improvement of land by planting trees, and by enclosures, showing the advantage of it over the lands that lie in common.
59. Of enclosures and trees planted in hedge-rows, both fruit and others, and the benefit thereby arising to the owners of such lands.
60. Reasons for enclosure and wooding of land, both for the public and private advantage, and the objections made against these answered and confuted in many convincing particulars.
61. How to take the stag, buck, hare, fox, badger, wild goat, and otter, which destroy corn, underwoods, &c.

"The Countryman's Almanack."

Meager mentions four kinds of ploughs: the single-wheeled plough, the double-wheeled plough, the plain plough, or without wheels; the double plough, or having two furrow mould boards; and the plain Dutch plough. The second plough is the turn-wrest of Kent. The portraits of the implements are the exact delineations given by Blythe in his book of "English improver improved," which fact, with the same descriptions given by Meager, show that no improvement had taken place in respect of ploughs during the half century that elapsed betwixt the dates of the publication.

Two sorts of turnips are mentioned: the round, or bulbous, and the long parsnep turnip. The leaves are recommended to be rotted on the ground for manure, and the roots to be given to cattle and swine. Nothing is said about the preparation of the land, nor of thinning the plants and killing the weeds. Meager thinks flax and hemp improve the land, being directly contrary to the modern opinion of these plants. He knew the commonly used manures, and gives the usual directions of application. Marle was a universal favourite with the writers of these times.

The Countryman's Almanack is merely relating to the weather from observed signs. The conclusion is,—

North winds send hail, South winds rain,
East winds we bewail, West winds blow amain.
North-east is cold, South-east too warm,
North-west too bold, South-west doth no harm.

Though no notice is made of animals, Meager's

book must be reckoned a very considerable advance in the progress of agriculture. The matter is better arranged than by the previous authors, and the subjects are sooner related, and more quickly dismissed. The title-page is still loaded with the contents of the work, and the prefaces are lengthy, and the dedications clumsy. Still a large progress had been made.

(To be continued.)

AUTUMN-CLEARING OF STUBBLES.

As supplementary to our observations in the last two or three numbers of the *Journal*, on the eradication of weeds, nothing can be more appropriate than a few words on autumn-clearing of stubbles. The subject has been brought before our readers in a variety of forms. We have alluded to its benefits mechanically, chemically, and physiologically; and to all we have said in commendation of it, we can absolutely add nothing, only to reiterate our convictions of its necessity. Our valued contemporary, the *North British Advertiser*, details the mode of root-clearing in autumn adopted by Mr. Tennant, of Shields, Ayrshire, which is just one other form of clearing to those we have before named. These were by the use of Ducie's scarifier, which possesses a wonderful adaptation to land under the influence of root-weeds which will choke the general run of ordinary implements. The next is, by the use of the broadshare or paring plough, which is within the compass of a smaller class of farmers, and can be worked easily with a pair of horses; and a third is an adaptation of tines to the common drag-harrow, which will be found to suit a small farmer who has no desire to increase too much his number of implements.

We some years ago adapted a share to fit to the ordinary Finlayson's harrow, of which a description is given below—

Herein figure 1 is the tine or share. Figure 2 is the socket for fitting it to the bull of the Finlayson's, in the manner described in figure 3. A is the socket: B the share; C the grooves in the socket; D, a screw which fixes the share in its socket, by wedging it to the bull E (balk). The cost of five of these attached to the Finlayson's harrow will be about £2 or £2 10s.; and they will be found, for small farmers, a substitute.

Fig. 1.

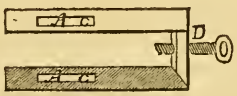


Fig. 2.

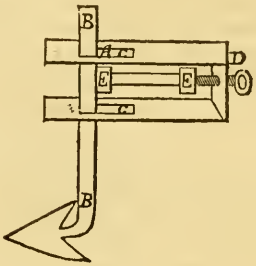
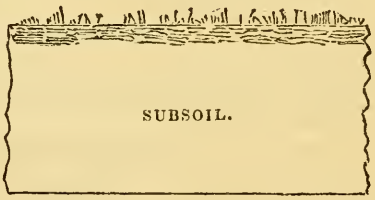


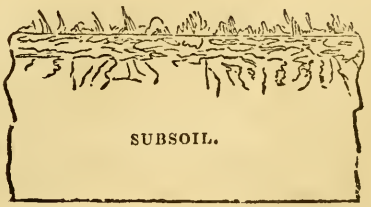
Fig. 3.

On very light land, however, and where the soil is extremely dry, a Finlayson's drag alone will break up the stubble, and sever the weeds from the soil without burying them; for the great secret of all autumn-clearing is to arrest and separate the weeds from the soil as speedily after harvest as possible, without burying them deeper in the soil than they exist when the cover of corn keeps the roots of the oxygen-loving couch near the surface of the land. At harvest, the following is an idea of the mode in which the root-fibres of the couch penetrate the soil:—



Section of the soil and subsoil immediately after harvest.

While six weeks after harvest, the soil more resembles the sketch below:—



Section of the soil and subsoil six weeks after harvest.

Hence the absolute difficulty of clearing a stubble

increases every day the operation is delayed after harvest.

Mr. Tennant commences with the Scottish grubber, which will, while the roots are compact and bedded together in knots, answer perfectly well. He first thoroughly grubs the whole surface, and brings the roots up, and then harrows the whole once or twice, so as to separate the soil thoroughly from the root and stems of the corn and the stubble. The weeds thus exposed to the winter's frost and rains, and the action of the atmosphere, decompose, and the ploughing of the lea goes on as usual in the month of April. He also contends that the soil holds the manure better for being so little stirred, rather than being ploughed up, and exposed to all the washing influences of the winter's rains. No manure is applied in the autumn to the land generally, but merely drilled with the manure. Two ploughings are all that is necessary in the spring; and as we understand his system, the roots are not gathered off. The soil becomes in a very fine tilth, and the crop of turnips is said to be very secure. As much as five acres per day are said to be done by the grubber.

The expenses of this against the old system are said to be as follows: taking the last-named or ploughing plan of clearing, the expenses are—

Autumnal ploughing	£0	10	0	per acre
Two grubbings in spring, at 2s.	0	4	0	,,
Harrowing 3 doubles, at 5s. ..	0	5	0	,,
Gathering weeds	0	5	0	,,
Two furrows, at 10s.....	1	0	0	,,
Harrowing and rolling	0	5	0	,,
	£2	9	0	

Mr. Tennant's plan—

Autumn grubbing	£0	2	0	per acre
Two autumn harrowings, at 1s.	0	2	0	,,
Two furrows in spring, at 10s.	1	0	0	,,
Harrowing, rolling, &c.	0	5	0	,,
	£1	9	0	

Showing a saving of £1 per acre. This, however, we think to be overstrained. Four acres per day is as much as can be comfortably done by three horses per day, and this with one man. We hardly see how a grubber could cover five acres, and only allow 10s. for the horses and men, when a similar sum is allowed for one acre's ploughing. We do not think ploughing at all so necessary as is generally supposed, but it is far too much to reckon it at 10s. per acre.

Then how far, on the generality of soils, may dependence be placed on two facts essential to Mr. Tennant's plan? It is certain that on some soils, so very light as to contract moisture by capillary attraction, entire dependence cannot be placed on their being entirely destroyed; and it is also indisputable that one grubbing will not be sufficient on many soils to get up the whole of the root-weeds to the surface. Now if this be so, it is clear that on some soils at least this plan of Mr. Tennant's will not succeed.

The soil must be cleared. For though every diminution of weeds, how small soever that may be, is useful, it is extremely desirable to get the whole to the surface at least, and for this purpose the first crop must generally be carted off. To burn them is the readiest mode of destruction, but it is very wasteful.

Though we neither quite agree with the figures nor the precise plan of Mr. Tennant, there is no doubt whatever that autumn-clearing is by far the best plan for all kinds of soil intended for turnips. —Gardeners' and Farmers' Journal.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

[FROM THE TIMES' COMMISSIONER.]

MORPETH.

In this letter we propose to give some description of the county of Northumberland, which we entered from the west by the railway from Carlisle. The valley of the Tyne from Hexham to Newcastle is highly picturesque and fertile. A broad sparkling river—now shut in by high banks clothed with venerable woods, now confined to its channel by embankments protecting rich arable holms, here peacefully gliding past the graveyard and the parish church, there more impetuously breaking over the rocky bed which forms the base of some old feudal castle—mingles itself with the tide a few miles above Newcastle, and then exchanges its picturesque character for that of commercial bustle and activity. Along the river the land is of excellent quality, let at from 40s. to 50s. an acre, and principally under cultivation. The holms, which on the banks of the Wharfe or the Tees form the rich feeding lands of the district, are here applied to the production of corn. Out of the valley the country is, on both sides of inferior quality, much of the south side being worth little more than 7s. an acre, the land cold and undrained, and the farming of a very ordinary description.

Between Newcastle and Morpeth the soil is generally a strong clay. Northwards of Morpeth and to the west it is a poor infertile clay. Along the seaboard and the line of railway past Warkworth, Alnwick, Belford, and to the border of the county, it consists of strong wheat land, more or less fertile, but generally of superior quality. Between the Cheviot Hills and the ridge which forms the eastern boundary of Tillside there stretches a tract of excellent turnip land, held in large farms by intelligent cultivators, and where the five-course, or Nothumberland, system of farming finds its best illustration. To the westward of this the country is high

and unenclosed, and stocked with Cheviot and half-bred sheep. The geological features of the county comprise the coal measures, millstone grit, mountain limestone, and greenstone.

The agriculture of the southern division of the county is not in general at all superior to that we have described on the cold clay lands of Durham. The farms are many of them larger in extent, but the land is chiefly undrained, and, being nearly all under the plough and very indifferently stocked, it appears to be in poor condition, and at present prices must be bearing hard on the capital of the occupying tenants. Very many farms have been surrendered to the landlords, who are now becoming thoroughly impressed with the necessity in which they stand, either to meet their tenants liberally by encouraging drainage and affording them temporary relief, or to find their whole estates abandoned to them in wretched condition. The appearance of the farm horses and the quality of the scanty stock sufficiently evidence the straits to which many of the smaller farmers have already been reduced, while the less carefully prepared fallows and diminished accumulations of manure afford no promise that the returns of next year will better their circumstances. The reliance has been so wholly on grain that any abatement of rent, which is unaccompanied by a wise expenditure in improvement by drainage, so as to encourage the keeping of stock and the more certain action of manure, will only postpone for a little the inevitable crisis. It must surprise many who have hitherto been led to consider the agriculture of Northumberland as a model for the rest of the kingdom, to learn that a great portion of the county, extending from near Newcastle on both sides of the railway as far north as Warkworth, is as little drained and as badly farmed as any district we have yet seen in England, and that the occupiers of the small farms can only eke out a scanty subsistence by careful parsimony, and by employing no labour except that of themselves and their families.

The larger farms in the district of which we are now speaking are better cultivated, but the farmers are even less hopeful. In the best times they assert that they never could calculate on making a gross return from their farms equivalent to two rents, and that now most of them can scarcely make even one. Many of them occupy more than one farm, and, as the farms of this class extend to from 400 to 700 acres each, it is not uncommon to find one holding of 1,000 to 1,500 acres altogether. The business they declare not to have been a good one ever since the war, and, the management continuing much the same, it is now worse than ever. A great reduction in the rent, we were assured by one extensive farmer, would not adequately meet his present difficulties. A case in illustration was mentioned to us of a strong clay farm of good wheat land, 600 acres in extent, the rent of which in 1825 was upwards of £800, besides £100 more for tythe, but which, notwithstanding a large expenditure by the landlord, would not at present bring much more from a tenant than half the former rent. Such statements must be received with considerable caution, though on the whole they show that the amount of rent has hitherto been out of all proportion in excess of the gross produce as the farming is at present conducted, and that the two must in future be made more justly to approximate.

Nearly all the landlords in the district are now satisfied that to keep their land in cultivation they must be ready to assist their tenants with drainage and farm buildings. Many have also given abatements of rent, and it is believed that those who have hitherto declined to do so are accumulating arrears much heavier in reality than the loss they would suffer by any voluntary abatement. All the agents who have been authorised to make abatements are ready to give you instances in which arrears have been at once paid off in consequence of this liberality, and of the confidence which it has given to the tenants to go on with such improvements as form the best guarantee to the landlord for the maintenance of his future rental. We may here describe the arrangements which the leading landlords of the county are at present adopting.

The Duke of Northumberland, whose great estates in this county are, with the exception of one or two farms, let on holdings from year to year, offers a revaluation to every tenant who finds his farm to dear. This is made by two gentlemen in the district, of high character and competence, and is binding on both landlord and tenant. If the latter, however, prefer to quit the farm, he is permitted to do so. The valuation assumes a certain rate as the average price of wheat, and at this rate all the new valuations are made, so that the different farms may be placed on an equal footing, and the whole estate be in a position for an uniform principle to be adopted hereafter in any further adjustment that may be necessary. The result of these valuations has been a slight reduction of rent, though in one or two instances there was an increase. The Duke then makes a discretionary abatement, corresponding to the difference between the real and assumed rate of prices, and this has been 12 per cent. on the corn farms, and 8 per cent. on the turnip and stock farms. His Grace likewise executes the requisite drainage on his estates at a charge of 5 per cent. on the outlay, supplying the pipes from his kilns at prime cost. He expends what is necessary for the improvement of farm buildings without any charge on the tenant. In an instance where a lease and corn rent was desired by the tenant, the Duke acquiesced. He offered leases to any of his tenants who might desire them, but it is said that his offer was accepted by only two farmers, so highly does his Grace stand in the confidence of the county.

The Duke of Portland has a considerable estate in the county, much of it very poor land, but his liberality to his tenantry is proverbial. His abatements here are said to be equal to 30 per cent., and this on a rental confessed to be moderate. He drains to any extent for 5 per cent.

Earl Grey has not made any general abatement, but he relieves any tenant who wishes to quit his farm; and in a case where a tenant occupied several very valuable farms on Lord Grey's estate he was relieved of one which he desired to quit, and permitted to retain the others, which were better worth the money. Lord Grey executes any drainage that is required at a charge of 6 per cent.

Lord Vernon drains for his tenants, paying for both tiles and labour, free of all charge.

The Marquis of Waterford gives 20 per cent. of abatement, and makes a large expenditure in farm buildings for his tenants.

These instances may be taken as illustrating the manner in which the landlords of Northumberland are meeting the present crisis; though we regret to say that on some estates of great extent the proprietors are so embarrassed that they plead their inability to meet their tenants either in one way or another.

In the southern division of the county the practice, in letting farms, has generally been by the agent naming the rent and offering the farm to a tenant. On the turnip farms of the north this has been the exception, the rule being to advertise for tenders and encourage the utmost competition.

Some particulars as to the cultivation of individual farms will best convey an idea of the agricultural practice of the different districts of the county. On a turnip farm belonging to the Duke of Portland, 400 acres in extent, the tenant grows 60 acres of turnips, 25 acres of which are swedes. He has a considerable portion of old grass, and the rest of the farm has been hitherto managed in a five-course. The tenant contemplates extending this to six or seven course by keeping his land three or four years in grass. On this farm, which is superior turnip land, and considered a model in its neighbourhood of liberal management on the part of the tenant, four cattle are fattened in winter, and about 36 are half-fed in winter, and finished on the best grass in summer. A stock of 80 Leicester ewes is kept, the produce of which, about 120 lambs in number, are fattened on the farm. The best are ready as soon as they are shorn, and last year were sold at 33s. each, besides their wool, which fetched 7s. more. The rest are put on young grass and sent off as they become ready. Five pairs of horses in winter and six in summer carry on the work of the farm. 10 carts of strawyard dung and 12 bushels of bones per acre are applied to the turnip crop, but this is reckoned an unusually liberal dose in that neighbourhood. The old grass land is occasionally cut for hay, and seldom receives any manure. The stock are all fed in open yards during the winter.

The ordinary management of strong land farms is the four-course, occasionally extended by the introduction of beans. Very few turnips are grown; and, as nothing else is tried on the fallow division, nearly the whole of it is bare fallowed. 24 bushels of wheat may be reckoned the average produce from the best land. One farm which we visited had been increased 20 per cent. in its produce of wheat by pipe drainage, and the farmer declared himself satisfied that this was a more valuable boon to him than a temporary abatement of rent to the same amount. On this, as on very many farms in the district, a steam engine is employed for thrashing the corn crop, but it is not applied to crushing corn, cutting hay or straw, steaming or cooking food, or in fact to any other purpose than thrashing. No manure whatever is purchased, and no cake, corn, or other feeding stuff.

On the home farm at Howick the Hon. Captain Grey has been for some years back endeavouring to introduce many improved practices which the experience of other counties has sanctioned. By thoroughly draining, subsoiling, and heavily manuring his land, he has greatly increased its produce both of corn and green crops. The corn is all drilled and horsehoed. The root crops are taken from the ground without injury to its surface by the use of Crosskill's portable railway. The rails are found very easy to shift, and the work goes on with great expedition. The Swedes are carried on the rails to the headland, where they are stored till required in long narrow heaps, thatched with straw. A handsome cattle-lodge has been erected, but on a scale unnecessarily costly, for the stall and box-feeding of cattle. The weight of the different kinds of food consumed by the animals is registered, and their relative progress is ascertained monthly by putting each animal on the weighing machine. Experiments have been made to ascertain the respective merits of stall and box feeding. A trial last season proved the advantage of house feeding in summer as compared with grazing in the field. Two short-horned cattle, two-and-a-half years old, as nearly of the same quality and condition as possible, were weighed on June 14, and each found to be 78 stone. The one was turned out on good pasture, the other was put into a loose box in the cattle-lodge, where it received cut grass, with the addition of 2lb. of oilcake daily. The two cattle, with others likewise experimented on, were weighed every month, and on October 22 the box-fed animal was found to have gained 26 stones, and the pastured one only 13. The saving in the consumption of food far more than compensated the cost of oilcake and attendance, so that the increased gain of weight, besides the accumulation of valuable manure, formed a clear advantage in favour of the box-feeding and soiling system. The other cattle submitted to the same experiment showed the same result, though not in an equal proportion of increase. The monthly weighings showed that while the pasture was fresh and juicy, and the weather warm, the cattle made most progress in the field. After the 27th of August the grass began to fail in quality, and the pastured lot then fell back greatly, while the box-fed lot continued to increase and improve. An experiment was tried, two years in succession, to ascertain the advantage of putting ewes on rape at the end of September, which clearly proved an increase of nearly 50 per cent. in the produce of lambs as the result of this practice. A very paying class of stock here is the small highland cattle, bought at the August Falkirk tryst, at from £2 16s. to £3 each. They are turned out on rough pasture, where they feed during the winter, getting but a very small allowance of turnips in snow or frost, and therefore kept at a trifling cost, then placed during the summer on better pasture, and sold off fat in October at £10 to £11 each.

The farm of Beal, on the line of railway between Belford and Berwick, is considered to be one of the best managed strong land farms in Northumberland. It contains 1,050 acres, 270 of which are permanent pasture. The rest of it is managed on the four-course system, varied by having a portion of the clover-break in drilled beans, which removes

the clover on that part to a greater interval, and makes it a more certain plant. Where the beans have been taken the land is left two years in pasture; 360 acres are annually in white crop—wheat, barley, and oats; 60 acres in beans, and 120 acres is sown grasses; while 180 acres are in bare fallow and turnips, 80 of which are swedes and 80 white turnips. The average yield of wheat may be 30 bushels, of oats (Hopetoun or Angus) 44 bushels, of barley 40 bushels, and of beans 30 bushels per acre. The whole of the fallow is manured with dung, the swedes with 20 carts of dung and 2 cwt. of guano per acre; and the beans are manured with dung, and cultivated in raised ridges, 27 inches apart, like potatoes, and repeatedly horse and hand hoed and kept clean.

The stock kept on this farm consists of 25 calves reared; 60 cattle are fed in the yards and boxes during the winter, 40 of which receive full feeding of swedes, with 4lb. of oilcake and 4lb. of beanmeal each daily for the last six weeks, and go out of the yards fat; 20 are half-fed in winter on turnips and swedes, and are finished off on the best grass early in summer. By this management Mr. Scott, the tenant, finds he can keep a larger number of cattle to break down his straw into manure than if he were fully to fatten on the same quantity of turnips a smaller number of cattle. When the cattle go to grass to be fed off they receive 4lb. of oilcake each daily, and with this addition to their food the field can fatten off 20 cattle better than it can 14 without cake, while the land is yearly improving in consequence. 240 Leicester ewes are kept, and their produce, 320 hoggets, are sold fat off the farm annually. The rest of the grass land is pastured by a flying or a shifting stock. The lease was entered into in 1839, and the rent of the farm is £1,700, tythe-free.

Mr. Scott has tile-drained 600 acres of the farm at his own expense, the landlord having allowed him one acre of clay to burn at his own risk, but with leave to sell to others as well as to supply himself. At that time, 1839 to 1846, tileries were less common than they are now, and Mr. Scott found tilemaking a very profitable business; so much so, indeed, that the expense of draining his farm was thereby materially lightened.

The cattle are principally kept in courts with sheds, one lot being fed singly in boxes. Mr. Scott contemplates feeding a portion of his stock in the yards, during summer, on cut grass, for the purpose of more perfectly converting his great bulk of straw into good manure. At present the manure heaps have to be turned twice or three times before they can be sufficiently rotted. The farm is very clean and in high condition, but the arrangement of the buildings, which are old, is very defective, and must occasion considerable waste of labour to the tenant.

The subject of drainage, and the propriety of levelling down the old crooked ridges on the strong lands throughout this county, have been frequently brought to our notice. The practical men all agree as to the advantage of having pipes or tiles with a sufficient orifice to insure a circulation of air as well as to carry off water. Anything less than two inches they think inadequate to this purpose. With regard to the depth of drains there is likewise considerable difference of opinion, the most experienced being agreed on the advantage of a depth, if possible, of not less than 3½ feet. In many cases in this county, however, drains are still being put in with the old and expensive 3-inch horseshoe tiles and soles at 2 feet in depth and 15 feet apart, just as if the experience gained during the last few years in all other parts of the country had never been heard of here. Every farmer we have spoken to strenuously disapproves the ploughing down of the old crooked ridges. These were made ages ago by our forefathers for the purpose of effecting that which we now more perfectly manage by under-drainage. But the system has been so long continued that the subsoil when cut across (as was shown to us by Mr. Dand, of Field-house), presents the same curvature as the surface; and, in cases where the attempt to plough down has been carried out, the result is said to have been, that the top of the old ridge being completely bared of good soil, produces little or nothing, while the old furrow, by being rendered too strong, gives a "lodged" and badly filled crop. In a case in which the opinion of practical men is so unanimous, we think it behoves others with less experience to be cautious. Nor, indeed, after a field has been drained, is there any practical inconvenience worth mentioning in the shape of these crooked ridges. Mr. Scott, of Beal, never ploughs his down, but he drills his turnip crop across them; he draws off his land for sowing his corn crops across them for the convenience of correct seeding and reaping; and he ploughs his lea across them for the same convenience. In working his green crop land he again forms the old ridge, and maintains it in its ancient shape.

Labourers are everywhere fully employed and at good wages.

THE PLEASURES OF GENTLEMAN FARMING.

Seven o'clock brings a summons to arise; and although an early hour for a bridegroom, it must be attended to, because "Jacob," my bailiff and factotum, has appointed to see me "fust thing i'th' marning," about giving the men their orders with regard to cutting an unnecessary drain to an unheard-of depth. I yawn my way to my dressing-room, where there is no fire, for the new housemaid is not an early riser, and "master" is too green at the trade to have yet become much of a disciplinarian. Luke-warm water produces a rugged shave, and inuring myself in dreadnought attire, I accompany "Jacob" through a drizzling rain to the "thirty acres," there to find two of the men cannot come because to-day happens to be "Weatherley revel," and for all the good I have done by my exertions I might just as well have remained in bed. A second toilet fits me for breakfast, and I look forward to a comfortable and domestic meal, the novelty of having my tea

made by Mrs. Nogo (I cannot quite bring myself to call her "Nelly") not having yet worn off. The widow, however, has had experience in the ways of the world, and one of the lessons which it has inculcated is never to hurry herself—above all, in such an important ceremony as the toilette; so I am reduced to the painful alternative of beginning breakfast without her (in which case I shall appear churlish, and have my tea badly made), or of sitting down to the day-before-yesterday's paper, already conned through, and last night fallen asleep over, to wait in patience for the arrival of my better half. Down she comes at length, very nicely dressed, but not feeling "very well," which I have already learned means being slightly out of sorts, and is a bad beginning for the day. "My dear," I wish you would speak to James about that tea-pot; it is disgrace fully cleaned, and nothing spoils servants so much as passing over these things." James is the new footman, a six-foot magnifico, and I should just as soon think of reprimanding Julius Cæsar; but I dare say Mrs. N. will do it for me, and twice as effectually. "You'll drive me to the lodge, Til, after luncheon," adds my wife, in an accent I never quite like to disobey; and although I had meant to get a quiet afternoon's shooting, I express a ready compliance, and breakfast progresses comfortably; I am just going to have a second cup of tea, when enters stately James, as though he were announcing a duke, to say that "farmer Veal" is waiting to see me in the study, as servants always persist in calling the apartment where "master" keeps his guns, &c. and as the gentle Mrs. N. signifies "I had better speak to him at once and have done with it," I forego my other cup and hasten to an interview with the yeoman, having for its object the purchase of a certain quantity of what are termed "store pigs." It is by this time getting towards noon, the hour at which I was once accustomed to enjoy the double luxury of a book and a cigar; but these "littering habits," as Mrs. N. calls them, I have entirely abandoned for ever, and contenting myself with the unsatisfactory substitute of a tooth-pick, I accompany "Jacob" to the yard to inspect a new arrival in the shape of a famous short-horned bull, whom I have purchased at the price of a hunter, but whom I dare not approach with any of the familiarity with which I should handle the latter animal. "Jacob" thinks I paid too much money for him, in which opinion I cordially coincide, and the morning passes off in a series of fault-findings with inefficient bricklayers and dull labourers, who only seem to comprehend how much more profitable it is to work by "the day" than by "the foot." Luncheon, in which I detect more of yesterday's dinner than I could easily believe to have survived, is interrupted by the collector of rates and taxes (imposts which I fancy my predecessor Segundo never dreamed of paying), and that functionary seems disposed to visit upon the successor all the deficiences incurred by the previous owner. "Have you ordered the pony-carriage, Til.?" says Mrs. N.; and my multifarious occupations having prevented the morning visit to the stable, which I had always looked forward to as so principal a charm of a regular life, I am forced to confess that I have neglected to do so, and to swallow as I best may the involuntary exclamation of "Dear, how stupid!" which escapes from the lips that have so lately vowed "to love, honour, and obey." The filth of the straw yard has made it necessary to adjourn once more to the dressing-room, before I am fit to enter a carriage of any description; and this time, with a pardonable anxiety to appear to advantage in the eyes of my late wedded wife, I get myself up with more than common care and smartness. Alas! the new south-downs, placed in a secluded meadow at the back of the house, have one and all broke from their moorings in a state of timid insubordination ludicrous to contemplate; and I cannot resist lending my assistance to "Jacob" and his myrmidons, in reclaiming the woolly truants to their original bounds. Varnished boots harmonize but ill with a clay soil, and I am greeted "as a very untidy figure," when I at length take my seat in the pony-chaise *en route* for Topthorne Lodge. The squire is not at home, having gone to shoot the outlying coverts, at Moor-bank, whither, had it not been for my farming avocations, I was to have accompanied him, and where he is now peppering away in all the enjoyment of a capital day's sport; so there is nothing for it but to drive quietly home again. The pony suddenly falls lame, and at the same time a tempest of wind and rain, which has been brewing in the horizon during the whole afternoon, bursts upon us in pitiless fury, and as there is not a building for miles of our road, we are exposed to the whole violence of the storm. The umbrellas have been forgotten of course, and we are drenched to the skin; Mrs. N's. *recherche* toilette, part of the lately acquired *trousseau*, being completely spoiled, and my sweet bride's silence, not to say reserve, becoming more profound with each succeeding gust. We reach Wildwood at last, and here a dry suit of clothes, albeit indued in a smoky dressing-room, restore me to something approaching towards comfort, and I refrain from disturbing Mrs. N., in hopes that by the time dinner is announced she may have recovered her former gaity and cheerfulness. That necessary meal is kept waiting, and the mutton irretrievably spoilt, by an enforced interview with one of my new tenants, who taking the opportunity of his return from Weatherley revel in a state of tipsy jocularity for an ill-timed interview with his landlord on matters of business, is good enough to favour me with his company for three-quarters of an hour, during which he discusses the weather, the ministry, Mrs. Nogo's health, in short everything in the world except the point at issue, and eventually takes his departure, having effected no decided result except the ruin of my over-roasted joint. A quiet evening, a snooze over the "*Quarterly*" undisturbed by any music (for Mrs. Nogo confesses she has become "very idle about playing"), and a cup of tea at nine o'clock, would console me for the annoyances of the day, but that my rest is interrupted and my nerves shaken by the keeper bringing in a poacher whom he has taken at this untimely hour, and whom he seems to expect, in the double capacity of magistrate and proprietor, I shall transport on the spot. The evening is concluded by a perusal of the county paper, in which the account of a horrid burglary accompanied with violence, and perpetrated at a lone farm-house not twelve miles from where we live, sends me to bed not at all satisfied that the life of a country gentleman, residing on his own property and farming his own acres, is half such a course of unruffled prosperity as in my London career I had ever been taught to consider it.—*From passages in the Life of Tilbury Nogo, Esq., in the Sporting Magazine for October.*

THE IMPORTANCE OF POULTRY TO FARMERS.

At a recent meeting of the members of the Sparkenhoe Farmers' Club (Leicestershire), Mr. Harrison read a most interesting paper on this subject, in which he says,—"I set out by endeavouring to combat an opinion which I find is pretty generally held by farmers, that hens and chickens, ducks, geese, and turkeys especially, are to be regarded in the light of depredators, whose business it is to rob the fields and stack-yards, for the sole advantage of the mistress of the family. There may, I admit, be some grounds for the prevalence of this opinion, in the fact that whilst the master sees the mischief which is done both to the field and stacks by the poultry, he is kept by the mistress as much as possible in ignorance of the profit, and is scarcely ever allowed to know its return. I shall at once admit that fowls and poultry generally will make great havoc in a growing crop of corn. I will admit, too, that they are very great nuisances in a well-kept rick-yard, and that they are intolerable pests when they make frequent visits to the garden. But, allow me to ask, will not a little care and extra labour greatly lessen such evils, if not prevent them altogether? Now it has more than once met my observation, that a farmer who has well scolded his wife and daughters for the depredation of their poultry committed near a gate or in the corner of a field, has allowed the sparrows to feast at their ease until they had stripped the headland of the field entirely of its corn. I have heard a very considerable farmer grudge a breakfast to his wife's hens out of his corn field, when he saw, without the least complaint, wood-pigeons and pheasants from his landlord's cover rise from his field by scores. And is there not many a farmer among us who will chase the hens from the rick-yard from the feeling that he cannot permit such wanton waste, whilst he views with comparative indifference the depredation of vermin, and tolerates the ravages of rats and mice? Now, Mr. Chairman, I must not be supposed to justify waste in one place, by proving the existence of it elsewhere. I merely wish to ask whether prejudice may not cause us to *overrate* the damage in one case, as much as it leads us to *undervalue* it in the other? A corner in a field of wheat or barley trodden down is very offensive to the eye; but value the damage, then measure the ground, and I will answer for it that an acre (*at the same rate*) will be worth a very considerable sum. So, in the stack-yard, a good fork-full of corn pulled from the rick, and distributed around it, would appear nothing less than a decent waggon load. But I am not even advocating *this* waste. Let all the gates and gaps against the corn-fields be thorned; let also all the stock of loose corn standing upon the ground in the rick-yard be protected by hurdles or faggots; and if the poultry will not pay the expenses of this precautionary labour, let it at once be given up. There are times, I believe, at which it may be a matter of good policy, as well as of necessity, to supply the poultry in the farm-yard with a small allowance of food. It would be folly to leave our cattle and our sheep to procure their own living in the fields during the winter, thereby to become so poor that the summer would be expended in restoring their condition and strength; and equally so would it be to withhold from the feathered inhabitants of our yards, during times of scarcity, the assistance which it is man's office to afford to the creatures beneath his care. But I would recommend that the cost of such assistance be ascertained, that its repayment may be ensured, or similar outlay avoided for the future. In combating successfully the opinion that poultry are universal depredators on the farmer's property, it will be necessary for me to show that very extensive supplies for their support are scattered by nature around us, and that by availing ourselves of these supplies, poultry may be made the source of very considerable revenue to the mistress of the farm-house, without at all interfering with her husband's corn, either when growing in his field or stacked up in the rick-yard. Before I go further, I must be understood on this point: I am no advocate for divided interest, even in the article of poultry. In my opinion no wife should be placed in such a situation as to *need* a separate source of income, and a separate purse. So that, if any thing in this paper may lead any of my readers to suppose that I am now endeavouring to advance the separate right and interest of the farmer's wives and daughters, by advising a greater attention to the management of the poultry, I beg to assure them they are mistaken. But though the ladies will not find in me an advocate for any *separate* right, I shall feel very happy if a suggestion of mine may be the means of increasing that portion of farming income, which I believe, by the law of courtesy, is generally regarded as their own. Over the greater portion of England, I find poultry is considered the perquisite of the ladies, and I shall regard it in such light. Let us now take a hasty glance at the large provision which nature has made for the existence and com-

fort of the feathered race; and next let us look at our hens, our ducks, and our turkeys, performing the assigned office in creation, by converting millions and millions of the lowest order of existence into food adapted to the use of man. Now there is scarcely a blade of grass, or the leaf of a plant, that does not harbour some fly or insect; and there is not a particle of soil or cow dung removed by the hens in scratching, but numbers of grubs or worms are exposed. No one who has lived about a farm can have failed to notice the activity displayed by a brood of turkeys in beating a grass field. *We* cannot see the gnats upon the grass; but their eyes detect the hidden food, and every movement of their heads indicates the death of a gnat, or fly, or moth; and if we examine them when they return to shelter, their craws will be found filled. I will not say that their living is entirely secured by insect life; for I have noticed ours more than once, during this season, rob a nettle of all its leaves, and by a clever twist of their beaks, strip the grass seeds from a bent—thus blending vegetable with animal food. No one who has passed any portion of his life upon a farm can entirely have overlooked the hens watching a digging operation going forward. When a disturbance of the soil takes place, their food is exposed, they scratch for themselves in the looser ground, and they avail themselves of every opportunity of picking up their prey. Only last week I noticed several attending upon two pigs (who were rooting up the grass), and thereby obtaining a good supply of grubs; the hens, in this case, follow the pigs from place to place, as if they considered the latter were only labouring for their pleasure and advantage. It must also have been noticed by hundreds of farmers how ducks wander among the grass in the dew of a summer evening: this is the season at which the earth-worms rise to the surface of the ground, and ducks are then only seeking their supper, and the earth-worm forms their prey. Some of our hens were this season charged with thieving from the gooseberry trees: they might be guilty of taking a few gooseberries; but if they did this mischief, we have, on the other hand, to thank them for some benefit. I repeatedly saw them working at the caterpillars, which had made great havoc with the trees. This insect provision of nature for the maintenance of our poultry is most abundant during the warm months, and as it begins to fail in autumn other sources of supply arise. I passed through one of our fields, last week, in which was a flock of turkeys: these were occupied in picking blackberries from the hedge; and as they had cleared off all within their reach, I determined to help them to some of the higher boughs; I was surprised at the avidity with which the fruit was seized, and at the quantity which was eaten; and in this instance hunger was not the cause, for the flock was in a barley stubble which had not been touched till that day, and in which was an abundance of corn scattered upon the ground. I next tried some hips: these were equally well received, and so would haws or acorns have been. Now, when it is considered that numberless insects are scattered over the whole of our fields, that animal life exists in abundance, not only above, but also beneath the surface of the soil; and when it is seen that our hedges are covered with fruits and other productions, which at present are not available to the use of man, it must certainly appear desirable that we should adopt the means within our power to bring them to profit and advantage. Worms, snails, gnats, flies, grubs, of all description, beetles, earwigs, &c., &c., would indeed be loathsome food; and further, they are so widely distributed, their collection would be impossible, even did they possess a marketable value; but Providence has kindly furnished us the means of converting all these things into human food. It has created a higher order of creatures to collect and consume these insects for man's especial benefit and food. We find this higher order of creatures in the poultry which runs about our ground: they assimilate food for us, in eggs and in their own flesh, and render matter of value to man, which was completely valueless before. You certainly have a right to ask some proofs that the above is not mere assertion on my part, and I will give it in two instances which came under my cognizance upon my own farm this season, and I choose these instances because the poultry have in these places no rick-yard, no thrashing, nor any corn field whatever to assist them. At a hovel by the side of a large field some poultry is kept for breeding and rearing chickens and turkeys for sale; and this year's account stands, up to the present time, something like the following:—

PRODUCE.	£	s.	d.
53 turkeys, estimated present value 4s.	10	12	0
30 ditto, second hatch, at 1s.	1	10	0
20 couple of fowls at 2s. 6d.	2	10	0
12 ditto, young, but safe, at 1s.	0	12	0
Eggs	0	8	0
	£15	12	0

COST.			
24 lbs. of rice at 1½d.	£0	3	0
8 bushels of barley at 2Ss.	1	8	0
8 ditto of tail-tail wheat	0	12	0
2 loads of barley-raking, set down to carry old stock through winter	1	10	0
	3	13	0
In favour of poultry and to pay labour	11	19	0
	£15	12	0

At the second place no food was given, and the account will show the value of the eggs alone, as what chickens were hatched were carried to another situation to be reared. Here there are 30 Spanish hens producing from 12 to 13 lbs. weight of eggs each, or raising a money value (upon the insects they picked up) of £6 for the season. It will be right to remember that this lot have to be kept through the winter, and will also want some replacing; but I think the chickens hatched by these hens, in addition to the eggs laid, will pay for the load of the barley-raking which I have set down for their winter consumption, and also fill up the vacancy made by deaths, accidents, and necessary change. I have no doubt, myself, that poultry may be made to pay for a moderate outlay of food, as well, if not better than the pig or other stock upon the farm; for, in addition to the very large quantity of provision which nature provides for them in insect life, there is (especially upon ploughed farms) an abundant supply for their wants many months in the year, both in the sheddings of harvest and getting in of stacks, and also in the picking of the straw which escapes the proper action of the flail or machine. Now a very large portion of this would be wasted entirely were it not picked up by the poultry in the yard. With all the aid then just mentioned, a very moderate supply of food, and a little extra labour at a certain season of the year, will be all that is required to make the poultry remunerative, and prevent them from being so universally regarded as pests, nuisances, and depredators in the garden, the stack yard, or the corn field. I hope I have said enough to satisfy my auditors that a reasonable profit may be expected from poultry when such are kept upon a farm for the purpose of turning the insects, grubs, beetles, and so forth, and also the shedding of corn, to a profitable account. If I may be considered to have established my premises generally, it will now be right for me to enter a little more into detail, and to give you my opinion of the relative value of the different kinds or varieties of poultry, as qualified to perform the office which nature has assigned to their tribe, viz., converting that which is loathsome, valueless, and waste, into marketable and luxurious food. In my opinion, the turkey here stands pre-eminent. It makes a greater return for care bestowed upon it, than any other common stock of our poultry yards. The old birds require little corn; and being, to a very considerable extent, vegetable feeders, they are well satisfied with, and will keep themselves in good order, if they can run to a heap of Swede turnips during the winter months. Then, again, they are so exceedingly tractable and docile, sitting anywhere and for ever if you please. They generally bring the whole of their eggs to perfection, and they are quite examples of motherly care, affection, and assiduity. A turkey hen, with good management, will rear twenty-five chickens on the average of seasons. In my younger days I had turkeys under my own management, and I do not believe that they need greater attention in rearing than common chickens. Give them wholesome food at regular intervals, let them have a good beat as soon as they are able to get about, keep them out of storms and the wet grass, and attend to the cleanness of their pens. The chicks, under such management, grow exceedingly fast, and will nearly get their own living by the time they are two months old. The oldest and best of this year's birds weigh now from 8 lbs. to 10 lbs., and will reach 14 or 16 by Christmas, without any, or with very little feeding, if the weather continues moderately mild. The Norfolk, the common black, the black with white spots, the grey or black and white, are all good colours. The pure white are generally the smallest birds of a hatch; and the mixed browns I have discarded entirely from my farm, for they were generally wild and untractable. There is one objection to the turkey, which will ever prevent this bird from being a general favourite. Bred originally in the wilds of America, he still retains his wandering habits—he travails far from his roost, and appears to want sufficient sense to guide him home; night overtakes him, and unless a friendly tree affords him protection in its branches, he hides his head in a hedge, and gives some prowling fox a meal before morning. I have seen 80 killed in a night, and unless the flock of turkeys are under the charge of a person who can safely be trusted to bring them home, they will always be liable to such disasters. A large range of ground is necessary to the habits of the turkey, and therefore it is only adapted to large farms. I rather think the duck stands next to the turkey as a valuable forager and an assimilator of food from animal matter for marketable purposes. Of all breeds the Aylesbury variety is considered to be the most valuable, but all ducks which I have seen have been endowed with duck-like properties—that is, they would eat to repletion, sleep, and eat again as long as a worm could be found to be added to their meal. I believe the Aylesbury derives its value in the London markets rather from ist peculiar management than from any superior properties it possesses. The market is chiefly supplied from a village near Aylesbury, whose inhabitants make duck feeding and breeding their business. A gentleman who knows the place well, described to me their method. The old stock is starved in summer, then forced by extra food in the autumn to make them lay, and in the winter, or early in the spring, hundreds of young ducklings occupy the floors of

the cottages both up stairs and down, and take the place of the children by the fire-places. By warmth and high feeding the ducks are made the size of geese, and are highly esteemed for the delicacy of their flesh. Here we see poultry feeding made the sole business of a village, and I have heard it is highly profitable. If, then, it is made to answer where all the food is given, it surely must pay where a large portion is obtained at free cost. We must in such assumption, however, make the necessary allowance for a difference in markets. Ducks cannot be called mischievous, and they may sometimes be turned into a garden with advantage. They are often of great service in cleaning clover, cabbages, and turnips from snails and slugs. Geese are reared with little trouble, and make a great return for the care bestowed upon them; but it is here more a question of comparative profit between the fowls and animals. They (like sheep or cows) live chiefly upon grass, and are only preventers of waste in picking up the corn shed in the fields. On good land I am inclined to think their keeping somewhat ill bestowed. Where they are kept in quantities their feathers should be made an article of value. Guinea fowls are rather troublesome articles; they are particularly liable to lay away, and require great watching. They may be made to yield a great return for their keep by management and care. As an instance of this, a lady told me lately that she had made four guineas that year by a single guinea hen—eggs and young ones included. Pigeons, too, are a great source of profit. In some places they are apt to be troublesome at harvest time, when the corn is laid, but a dovecote should be maintained on every farm, to ensure the destruction of the seeds of small weeds, and to convert such refuse into food for man. My experience certainly has not been sufficiently great to enable me to speak decidedly to the relative value of the different breeds of fowls, but as far as it goes I will now give you the results of my observations. The Cochin China, which is at this moment all the rage, I hold in low estimation for real usefulness; its awkwardly shaped body, and its very small eggs reduce it much below many other breeds in eligibility for the table or other productiveness. Its docility and gentleness make it one of the best of mothers, and must ever cause it to be a great favourite with poultry breeders. As my paper has usefulness and profit for its object, I will forbear all notice of the Cochin China, as a specimen of fancy poultry. The Malay, ere it was crossed with the Cochin China, was a plump and close feathered fowl. Its body brown, with darker neck, and it is mounted on rather high and yellow legs. It is a beautiful bird for the table, but a bad layer, often sitting after the twelfth or thirteenth egg. It is a very hardy and courageous bird, and the hen will gallantly and successfully defend her chickens from the attack of vermin Where rats abound, the small brown Malay hen is invaluable for rearing poultry. The Spanish are a fine fowl, of a rich black colour; an everlasting layer, and their eggs are very fine. Seven of these eggs weigh a pound, whilst some of the Cochin China require ten to make the same weight. The chickens of these fowls are very bare of feathers, and therefore suffer in rainy weather if not provided with a shelter. The Hamburgh, both gold and silver, in their divisions of speckled and pencilled, are rather fancy than useful fowls. They are good layers, which is all I can say at present in their favour. The Runkin is a very deceitful little fowl; it is beautifully plump, and if its size can be increased it will be found an eligible breed for the table. The Game is a hardy fowl, more valuable for the table than for laying; it has many admirers, who generally speak highly of its merits. There are numberless breeds all having merit in the eyes of their fanciers, but I must forego a particular notice of these or I shall swell my paper to an undue length. There is, however, one variety which cannot be passed over in silence, and this variety is the Dorking. I have turned my attention to poultry this season with the hope of making it a paying speculation, and, for this reason, I have been more particular in noticing the merits and the habits of the different descriptions which are now running about the farm. I have some Speckled Dorkings in two places mixed with other specimens, and I have no hesitation in saying that they decidedly beat all other kinds in looking out for themselves—they are the best foragers of any class, and therefore best adapted to fill the office which nature has assigned to poultry. But besides this there is no other variety which will (with the same keeping and in the same time) produce the like amount of flesh for food. This is not a solitary opinion, for a gentleman near Birmingham, who has kept poultry all his life, gives me the same high character of his Dorkings. As layers they equal many of the other descriptions—as mothers they are only inferior to the Cochin China and Malay, and their general appearance, beauty of plumage, symmetry of make, will entitle them to the full consideration of the poultry keeper. When all the qualifications of this class are brought into calculation, in my opinion it decidedly deserves to rank next to the Turkey in general estimation. I have now noticed the office which I conceived nature designed our poultry to fill, namely, to turn to man's use the sheddings of harvest, the fruits of the hedges, and the insects, the worms, and the slugs, which cover and in many instances injure the produce of our fields. I have also given you

my opinion upon some of the varieties of poultry, setting forth to the best of my ability and experience the various qualifications and the claims they have upon our consideration, from being fitted to perform their proper functions in the economy of creation. I have very little more to say upon the subject, and must therefore conclude my paper by offering a few general remarks upon the management of poultry. It must ever be borne in mind that dry gravelly soils and warm and sheltered situations are most conducive to the health and growth of fowls, turkies, ducks, and geese, and that on damp soils, clays, cold and exposed places poultry will not thrive without having some very considerable care and attention bestowed upon them. I shall adapt my remarks to the more unfavourable situations; but their general tenor may still be useful to those who, favoured by soil and climate, will need them least. To enable a keeper to maintain a full complement of poultry upon the farm, it will undoubtedly be necessary to afford them some assistance by feeding during the winter months. This must be measured by circumstances. Where there is a great deal of thrashing and foddering going forward, and where there is always some Swede turnips at command, poultry will need little assistance from the hand of their keeper. I have adopted the plan of stacking up for their use a load of barley raking at places where there is no thrashing or foddering; they may here supply their wants by their labour, and their stack will afford them both food, exercise, shelter and amusement. Shelter from the winds is absolutely necessary for poultry—nothing suits them better than to bask on a bank on the sunny side of a hedge. I should advise some plantation of evergreen to be made near the building in an exposed situation, for the hens to creep under. Warmth is equal to food, and attention to the comfort of the roost at night, and shelter from the winds out of doors, will be amply repaid in eggs and chickens in the spring. Any one wishing early laying must not only select the early hatched pullets of the previous year for the purpose, but must also feed them well, and keep them warm. Where large numbers of hens are kept it is very advisable that the office of poultry keeper should be the sole employment of one person, who should not be called to other work on any occasion whatever. I say this because the eggs are often lost for the want of looking up, and the sitting hens are sometimes too long from their nest in search of food. Nor is this the only inconvenience—when the poultry is neglected, layers will get upon the nest of the sitting hens to the annoyance of the latter, or to the damage of their eggs. The process of incubation never goes on better than when the parent finds her nest in some hedge bottom, where the nettle and long grass hide her till she brings forth her brood. But where there is a large number of hens kept many will quarrel for a nest, and in such cases all others must be kept away by guarding the nest, or the sitter must be moved to another situation. This is said to be difficult to manage, but I assure you it can as readily be done with fowls as with turkeys by gentleness and ordinary attention. In such cases I would recommend a number of boxes to be fixed upon the ground in some spare building, the occupants of which, when sitting, might all be let off together to be fed and watered, and at proper time might be enclosed again, each in its separate apartment, which plan is a great saving of trouble to the attendant, and will generally be accompanied with success. Nature says to the hen—fix your nest upon the ground. And though man's interference may have caused her to lay her eggs upon a loft, it has not yet been able to overrule the original direction. I would advise in this respect that nature's dictates are followed as implicitly as they well can be. When chickens are young it is needless to cram them with food. Nature has here provided for their early support, for during the last stages of incubation the yolk of the egg from which it springs is absorbed into the body of the chicken. I once found a brood of chickens which had been hatched in such a situation as to preclude all possibility of their obtaining any food whatever; they were still healthy and strong though they had lived in close confinement and almost total darkness, till they had feathers in their wings nearly two inches in length. It is equally absurd to cram young turkeys; they will peck when nature requires them to make efforts for their support, and the sooner the fashion of forcing peppercorns down their throats is done away with, the better. Let these young things have fresh air, and the warmth of the sun; give a few bread crubs, a boiled egg, or a little rice, and keep them dry, under shelter of some building or hedge from the wind, and in a very few days they will get about, and will soon be able to seek food for themselves. There are some casualties in the flock even with the best attention. Vermin are often very troublesome, and, in some places, the carrion crows and magpies will carry off the duckling when advanced to considerable size. The only remedy in these cases is the destruction of the cause of the evils. Death, too, will ensue from disease. I cannot, I am sorry to say, give any specific to the complaints of poultry. The only course I can recommend when epidemic seizes the inhabitants of the poultry yard, is cleanliness in the roost and pens, and the removal of the young ones to a different beat. I have known a large lot of chicks that were dying daily, become quite

healthy on removal to the vicinity of a wheat field, where they could roam at pleasure among the standing corn, and obtain a thorough change of food. In some parts of England poultry is penned and fatted for the table. I certainly have not carried my attempts to any length in this line, but as far as they have gone they have proved a failure. I have heard, too, where the process of fattening is adopted, that after a certain period of treatment the poultry will begin to sink. I shall for my part be contented (for the present at least) to aid their feeding by a little extra food, leaving them full range for air and exercise. I fully expect to be told that I have omitted many points that ought to have been noticed. Some may, perhaps, ask how many hens may be kept together with advantage? and to such question I answer—circumstances alone must determine the number. Domestic fowls seldom travel far from the building they occupy; and hence there is not, to them, as there is to the turkey, an almost unlimited supply of insect food: perhaps thirty is the maximum number to be kept at one place. I have no doubt, also, that I shall be reminded that poultry have numberless wants that I have forgotten to enumerate; amongst these will be found lime, or oyster shell, to cover their eggs; sand, or ashes, for dusting themselves, and a copious supply of water for their thirst. There will also be required coops, pens, frames for feeding the young chickens under, and many contrivances to carry on the business of the poultry yard, with any convenience to the keeper. The greatest desiderata in the rearing of poultry are the means of hatching an unlimited number of eggs. The earliest hatched chickens always become the finest birds, and are also reared with the least trouble; besides all this, a supply equal to the demand cannot, in the commencement of the season, be brought to market. Now at this time only a very few of the hens will sit. There has been invented lately an apparatus called the Patent Hydro-Incubator, which is described to be of easy management, and is said to be efficient in its office. This machine will perform the duties of several hens, and will, not exactly sit upon, but will convert or change 200 to 400 eggs into an equal number of chickens. Now this apparatus is just the thing wanted by every poultry keeper, and if it maintains its pretensions, by realising its promises, would go far to fill up the desiderata complained of. I last spring made enquiry about the price of this machine, but I found it altogether beyond a farmer's means,—the cost of one for 200 eggs was £42 10s., and a larger size, capable of hatching 400 eggs, was above £84. I tried to get over the difficulty by a contrivance of my own, and applied the steam from a warming apparatus to such purpose. I maintained for three weeks an equable temperature, and *really* succeeded in hatching chickens. I do not boast of my success, nor shall I advise my friends to follow my example, till I have been more fortunate in my attempts. Still I am well satisfied myself with the result of the trial made, and am assured the plan is feasible, and will eventually be carried out. There are many appliances to the production and rearing of poultry which farmers little dream of using. I met, the other day, with an account of a method for ensuring to the poultry a large gupply of animal food during the winter, and as it may suggest some useful idea, I will give it ere I close my paper. "Dig a place (as many feet square as you please), and slope it at the bottom to allow superfluous water to run off; fill it with straw to the depth of six inches; next a layer of horse dung covered lightly with earth; over this earth pour blood, the entrails of animals, or any garbage which can be procured, mixed with chaff; continue these layers to the height of four feet, and cover the whole with bushes and stones. The rains will soon produce the putrefactive fermentation throughout the mass, and there will then be engendered myriads of worms." We perhaps may not construct a regular verminier, but could we not adapt our compost heaps to such purpose, and thus make them serve a double use? If poultry is to be made a paying matter, its maintenance at a cheap rate must form a part of every farmer's consideration. It perhaps may be said that in a pecuniary point of view the culture of poultry will ever be beneath the consideration of the farmer. I have no means of assertaining the exact annual value of the poultry raised in Great Britain, but taking the estimated consumption of London as a comparative guide, it must amount to some millions of pounds sterling. I believe I have seen a published account that the eggs imported from France into London alone exceeds yearly £10,000 value. I am sure, Mr. Chairman, that we cannot look upon the poultry of our yards with indifference, even in a pecuniary point of view. I know well that they have often afforded great aid in the maintenance of a family, and with proper care and fair attention I am well satisfied they can be made to do more. I have no wish to make any farmer's wife a manager of poultry in her own person: she may have other offices to perform, and she may be far better employed in her household cares and family duties, than in looking up eggs, feeding the chickens, or in sending her turkeys to their roosts; but I would have every farmer's wife able to direct her deputies in all the minutia of their charges. She, at least, should be able to rise above all vulgar prejudices, and manage the poultry rationally, from a thorough acquaintance with their history, their wants, their habits, and the

offices which nature has formed them to fulfil. There is a plan often adopted on some farms where labourers are fixed in cottages upon it, of paying their wives a certain sum per head for every fowl or turkey, and so much for every score of eggs. When the honesty of the party can be relied upon, this is a very good and convenient arrangement. The fee for rearing a turkey is generally 6d., a goose 4d., the same for a couple of fowls, and 1d. per score is generally paid for the collection of eggs; and the cost of rearing last year on our farm, upon such calculation, amounted to about 12¼ per cent. upon the gross value or sale of poultry. A philanthropic farmer can never regard the cultivation of poultry as an object beneath his care; he will always look upon it as a means of increasing the supply of human food; and to carry out these means to the fullest extent, he will use that knowledge which observation and experience confer. He will look to the fowls in his yards with as much consideration to the improvement of their size and necessary qualifications, as he does to the improvement of his cattle and sheep. He will not patronize a degenerate race, but will import from a distance some better and healthier breeds. The interest lately exhibited in the article of poultry, shows that its value is now generally, if not nationally, appreciated. Exhibitions are now held in various parts of the kingdom, and the breeding of hens calls forth as much rivalry now as the breeding of horses. It is not my purpose, nor is it my intention, to touch upon the cultivation of fancy poultry. I certainly would wish to see our fields and yards filled with birds of fine plumage and symmetrical form; but I would not wish to see these unless they were at the same time patient and assiduous mothers, good layers, and of great value in the market for their size and flavour. My closing advice, founded on my own experience, is this: treat your poultry with the utmost gentleness, care for their comfort, and feed them liberally in times of scarcity of food, and then I will venture to promise that your turkeys, your hens, your ducks, and even your geese, shall gratefully yield you a profitable return.—Leicester Journal.

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

THE SOUTHERN AND WESTERN COUNTIES.

Letter XXX.

(From the Morning Chronicle.)

I now propose to take a general survey of the condition and prospects of the labourer, in what kingdom.
is pre-eminently the Hop-growing district of the
This district comprehends the whole of Kent, the whole of Surrey, and the eastern moiety of Sussex. It comprises an area of a little upwards of 3,000 square miles, or about 1,950,000 acres. The hop is not, however, cultivated to an equal extent throughout the whole of this region. It is far more prominent as a feature in the agriculture of Kent than in that of either Surrey or Sussex. There are few parts of Kent in which it is not more or less produced. In Surrey a less quantity of it is raised in proportion to the area of the county than in Kent, but its culture may be regarded as general throughout the county. In Sussex, on the other hand, it is chiefly confined to the eastern division—farming operations, in their ordinary acceptation, almost exclusively engaging the attention of the occupiers of the soil in the western division. In Kent the chief scene of the hop cultivation is the vicinity of Maidstone, and indeed the whole of that portion of the valley of the Medway which lies between Tonbridge and the chalky ridge that intervenes between Maidstone and Rochester. In Surrey, it is, perhaps, in the parish of Farnham that its cultivation is carried to the greatest extent. In east Sussex it is grown to some degree, in the neighbourhood of Lewes, but the principal scene of its cultivation in this county appears to be Rye and its vicinity.

Nowhere, perhaps, even in Kent, is the hop exclusively cultivated. Its growth is a feature, and nothing more, in the agriculture of the district in question. In Kent there are large tracts of cultivated ground on which the hop is not to be seen. Nor are these, in every instance, tracts on which it could not be successfully raised. It is true that there are many districts in Kent, and in the other counties, grouped with it, in which the culture of the hop could not be advantageously carried on—but even in Kent, where its cultivation is most prevalent, there are large tracts in which it has never been raised, or from which it has disappeared, although they are in all respects well adapted for its production. And you usually find its cultivation exceptional to the general agriculture of the district. It is only in a very few instances that you see farms of any size converted *in toto* into hop gardens—certainly in fewer instances now than formerly. To cultivate the plant on a large scale would require more capital than the great majority of the hop growers possess. A few wealthy capitalists have appropriated considerable tracts, not far from Maidstone, exclusively to the production of the hop, with great success, I am informed, in times past, but with very dubious prospects for the future. In the great majority of cases in which the plant has been and is still raised, the hop garden is merely

an appendage to the farm. And it is the same in Surrey and East Sussex. The exceptional character of the business may be inferred from a glance at the farmsteadings, in the districts in which hop growing is most attended to. You almost invariably find the apparatus used for drying the hops, a mere addendum to the ordinary appurtenances of a farm. The Occupation Returns of the last census, too, clearly show that hop growing is not regarded as an exclusive pursuit. The number returned for all Kent, as exclusively hop growers, in 1841, did not exceed seven. In Surrey and Sussex none were returned as such. And whilst in Kent there were only seven returned as exclusively hop growers, the number returned as agricultural labourers was close upon 40,000. If we look for the employers of these men, we find that they consist of from 5,000 to 6,000 farmers and graziers, amongst whom are the cultivators of the hop. In treating of the general subject of labour, therefore, in these counties, it is with farm labour, in its usual acceptation, that we have chiefly, as elsewhere, to deal; although in parts of them that labour is so influenced by the cultivation of the hop, that it is impossible to treat separately of the two in pursuing an investigation like the present. Even in districts which are exclusively appropriated to the ordinary purposes of tillage, and which are, comparatively speaking, far removed from the hop growing sections of the counties, its cultivation has a sensible effect upon the condition of the labourer. This, of course, applies more particularly to Kent, where the growth of the plant is more general than elsewhere.

Taking the same basis of culculation as on former occasions, we find that in Kent the number of those employed as agricultural labourers, or otherwise dependent upon agricultural labour for support, was in 1841 about 130,000 souls. This, in a population of 548,000, gives but about 23 per cent. of the whole. We have seen that in other counties, the proportion was 33 1-3 per cent. of the whole population. This, indeed, is the case in one of the counties of the present group—Sussex. In that county, the population in 1841 was within a fraction of 300,000. The number of agricultural labourers was about 30,000; making the whole number dependent for support upon farm labour little short of 100,000. In Surrey, the proportion was still smaller than in Kent; for, out of a population of 583,000, only 70,000 were dependent for their maintenance upon agricultural labour—or about 12 per cent. of the whole. But the causes of these varying proportions are obvious. Sussex is a purely agricultural county—for, although it has a few ports, it cannot be said to have any commerce. Indeed, some of its ports have long had more political than commercial importance attached to them. Both Kent and Surrey may, on the other hand, be regarded as metropolitan counties—a portion of the metropolis being situated in each of them. The whole of the southern district of the metropolis, with the exception of Greenwich, is comprehended within the limits of Surrey—that portion of London alone (forming but one-fourth of the whole metropolis) containing a larger population than any of the capitals of Europe, except four—viz., Paris, Constantinople, Naples, and St. Petersburg. It is here that the great masses of the labouring population of Surrey find employment, as mechanics, artisans, and otherwise. The number returned as labourers in this county, in contradistinction to agricultural labourers, was from 30,000 to 35,000—who, with those dependent upon them, would make about 120,000, or more than a fifth of the whole population. The number of the corresponding class returned in Sussex was but 10,000, who, with those dependent upon them, would make about 35,000, or somewhat more than one-ninth of the whole. What applies to Surrey applies also to Kent, but in a less degree—there being but a comparatively small portion of the metropolis within the latter county. But it is surrounded by a belt of busy seaports—such as Woolwich, Gravesend, Sheerness, Chatham, Margate, Ramsgate, Deal, Dover, and Folkestone—which, as the scene of great Government works, as fashionable resorts, or as commercial stations, give rise to a considerable demand for labour other than agricultural. It is, however, with agricultural labour that I have here chiefly to deal; and, in speaking of it I shall—considering the influence which it exercises over the circumstances of the labourer generally in these counties—first draw the reader's attention to the subject of hop cultivation.

There are many who regard the cultivation of the hop as a great, if not an unmixed, evil to the district in which it is produced. As it is in Kent that its production is carried to the largest extent, so it was there that I found this opinion most prevalent. Many think that it would be a great boon to the counties in question if the hop altogether disappeared from their surface. It is not denied that great profits are sometimes realized from it—the complaint is, that it injuriously affects the general interests of the districts in which it prevails, by (amongst other things) greatly deteriorating the ordinary agriculture of those localities. It is alleged that the cultivation of the hop "starves the land." There is perhaps no other county in the kingdom, the soil of which varies so much in respect to its capabilities, as that of Kent. With the exception of the large central tract known as the Weald, and the chalky ridge which sweeps through the county from the South Foreland, across the valley of the Medway, and on almost to Gravesend, the whole of Kent presents to the eye the appearance of a garden. The ridge alluded to is in many places bare and unproductive, with stretches of woodland here and there at its base. Throughout the Weald the woodland is interspersed with the naked wild, the two forming together the district known by that name—a district not confined to Kent, but stretching through Surrey into Hampshire, and into the centre of Sussex. Here and there portions of it have been brought into cultivation, but vast tracts are yet unreclaimed—although the spots are exceptional in which it is irreclaimable. To the superficial observer the cultivated portion of Kent, which comprises the great bulk of its surface, is equally productive throughout. It requires, however, but little observation to detect the error of this conclusion. It is only here and there that the soil is really rich and heavy. It is

to be found in many places constantly alternating between chalk, sand, gravel, and rich fertile loam. The quality of the soil is pretty well indicated by the timber which it bears. In many parts of Kent it is small and stunted—whilst sometimes a ridge of heavy timber, showing the course of a vein of rich loam, may be seen between two belts of much lighter wood, indicating the presence of more meagre soil. In other places small isolated clumps of heavy wood are to be met with, surrounded by a more stunted vegetation—the latter supported by a soil through the thin coating of which the sand comes frequently peering to the surface. But in other parts of Kent, as towards its eastern extremity, there are large tracts of heavy and rich land, on which corn is raised regularly and in abundance. The quality of the land, in some portions of the interior, and towards the south and south-west of the country, may be also inferred from the average rental which it commands, which is not much above 14s. or 15s. an acre. In some places—as, for instance, in the neighbourhood of Tunbridge Wells—there are farms now in the market for which there is no offer even at that rate. It so happens that it is chiefly in the districts in which the land varies most in quality that the hop is most generally cultivated; and it is almost always the best lands that are appropriated to its production. The inferior parts are left for the growth of corn and grass. Take a particular farm, for instance, and you find the hop garden, if it includes one, occupying the best part of it as regards soil. It is from the inferior portion that the cereal returns are looked for. And not only is the part of the land given up to the hop generally the best on the farm, but it is also that on which the farmer bestows his chief attention. The land must be kept in good heart to produce this plant, and it too frequently happens that the manure which should be applied to the corn-field is transferred to the hop-garden. Even were the land generally heavy and rich, this would be bad treatment of it, so far as regards the production of grain crops. But it is not so; and the evil of the system is, that this practice of impoverishing the corn land is prevalent in districts in which the latter, from its quality, requires a great deal of manure to enrich it and keep it in heart. It is seldom that, in these cases, the land is sufficiently kept up to get good wheat crops from it. It is systematically neglected just where it should be systematically cared for. Even when it is properly dressed, and brought up to the right point for wheat, it soon falls back "out of repair," unless manure is constantly applied to it. Yet such is the soil which is robbed of its proper quantity of manure to enrich the hop-gardens. And if the soil in these districts is not sufficiently kept up for white crops, it will be readily inferred that it is certainly not so for green crops. Such is the case. No one can travel through the interior of Kent without having this fact forced upon him. The cultivation of green crops enters but very slightly into the agriculture of this part of the county. Here and there you may see a turnip or a potato field, or one set apart for the production of mangold wurzel. But they are few and rarely met with, the soil being chiefly divided between the hop-garden, the corn-field, and the meadow. When a hop-garden is converted into a corn-field the most luxuriant crops are generally got from it; but even in such a case the land must be well kept up, or it soon becomes meagre and comparatively unproductive. Yet such cases show what the land could do if it were properly treated; for in many instances in which the hop-gardens are thus dealt with, the soil which forms their basis is no better than that which has been stinted for their sake. This is the evil of which many in Kent complain—an evil which injuriously affects almost the entire agriculture of the county; and on this ground it is contended that the entire abandonment of the hop cultivation would be fraught with benefit instead of evil. Had these views been presented to me only in a few isolated instances, I should not have deemed them worthy of so much notice. That I have here laid any stress upon them, is simply because I found them very generally entertained.

Another objection offered to the continued cultivation of the hop is the gambling character of the business. It is only occasionally—say once in three or four years—that it turns out a favourable speculation. But then the profits are sometimes so great that many are lured into the pursuit whose means do not justify their embarking in it. Like the business of tanning, as formerly conducted, which made but a slow return upon the capital invested in it, that of hop-growing should only be undertaken by those who can afford to wait patiently for returns on the portion of their capital so applied. But it is not confined to such; small farmers, with little capital, rushing eagerly into the adventure. It is by the splendid prizes which are sometimes drawn that they are enticed to take a share in the lottery. This will be readily understood when it is remembered that—under circumstances, however, which cannot be expected to occur again—the hop has fluctuated in price from £30 to 40s. per cwt. Many small farmers in Kent are constantly paying too much attention to their hop-gardens, and too little to their fields. Even when agricultural distress has not been complained of elsewhere, numbers of the hop-growing farmers have been floundering in difficulties; and so it is at the present moment. Last season was pre-eminently disastrous to the plant; and so large was the stake that even the comparatively ample returns of the fields have scarcely sufficed to make good the losses of the hop-gardens.

It is not easy to determine what effect upon the general interests of labour in the county the diminution of the hop cultivation would have. There can be no question that it would be injurious, unless the improved cultivation of the fields gave rise to an additional demand for labour in that direction, equivalent in extent to the amount of labour left unemployed by the abandonment of the hop. Whether an improved cultivation would or would not result it is not necessary for me here to discuss, as I have put forth no opinion of my own in favour of the relinquishment of the hop. This, however, is certain, that were it abandoned, a good deal of capital which is now bound up in a very precarious pursuit would be released, and rendered applicable for other purposes. It is also obvious that the land

in such case would not be starved as it is now, inasmuch as the manure which the hop-garden now monopolizes would then be more generally distributed over its surface. It is likewise probable that were high farming resorted to, for which Kent is as well adapted as most counties in the kingdom, the demand for additional labour would more than cover the *hiatus* left in employment by the cessation of hop cultivation.

It is not to be denied that, with the exception of gardening and nursery work—of which it is, in fact, but a branch—hop-growing is, of all agricultural pursuits, one of the most general and constant dispensers of employment. It furnishes work during the bulk of the year to people of both sexes and of all ages. Economy in the work of production has, indeed, embraced the hop-garden as well as other scenes of human industry; yet still the average expenditure per year upon an acre of hops is fully seven times as much as the average outlay per acre upon corn land, even where farming is not pursued in a slovenly manner. The average outlay per year upon the hop-garden is from £20 to £22 per acre. This expenditure represents employment under a favourable aspect; that is to say, it represents a great deal of it concentrated within a limited space. Not only can the father and mother and children be employed in the hop-garden, but there are branches of the labour which they are each peculiarly adapted for undertaking. It is thus that not only may a whole family be employed, as in other agricultural operations; but the requirements of the hop-garden are best attended to when the industry bestowed upon it is of that varying character which the labour of the different members of a family presents. Any serious disturbance, therefore, to an occupation so well adapted for administering to the necessities of the labouring poor, cannot be contemplated with indifference, unless a better mode of effecting the same object be at hand, and capable of being at once resorted to. On the other hand, it must not be forgotten that a pursuit which not only admits of, but is best promoted by, the employment of persons of different ages and sexes, is by no means attended with unmixed good. It but too frequently administers to the physical, at the expense of the moral, wants of the family. When children may not only go into the hop-garden, but their presence there is more desirable than otherwise, the business of their education, if attended to at all, is liable to frequent and very serious interruptions. Nor are even its physical advantages altogether without drawback. The mother of a family cannot be both in the hop-garden and at home; and home is her proper sphere. Her absence from it injuriously affects both the comforts and the interests of the family; and many a working man, both in Kent and elsewhere, have I heard deplore the necessity which seemingly existed for his wife betaking herself to the fields. You may prove to demonstration to them that they would be better off, even in a physical point of view, if their wives remained at home and attended to their household duties; but the temptation presented by the few extra shillings which may be earned by the wife is, in most cases, sufficiently great to overrule all other considerations.

It may also here be remarked, that hop-work is generally done by the piece—a condition of work favourable to the labourer, until the competition becomes greatly disproportionate to the field for employment; and this gives rise to a relationship, in many cases, between the employer and employed in the hop counties, which is by no means prevalent in the other agricultural districts of the south. When a woman labours in the field in Dorset, for instance, she is generally hired directly by the occupier of the soil—being thus, as regards the employer, in precisely the same position as her husband, the only difference between them being that her work is usually the lighter, and her wages invariably the lower of the two; indeed, in many cases, husband and wife, and brother and sister, not only work in different fields, but also under different employers. In the hop districts it is seldom that you find a family thus dispersed. It is of course competent to a woman or any of her family to take work, here as elsewhere, directly from the employer, and in some cases this is done—more particularly in connection with those operations in the business of hop-growing for which women and children are best adapted. But, generally speaking, the practice is otherwise—the family usually working together, the husband taking the work, and his wife and children aiding him in the performance of it. This operates sometimes to the relief of the more tender members of the family; but at others it causes their subjection to very severe work. The wife is sometimes made to participate in the most laborious occupations of the husband; whilst in some districts the work is so distributed between them that she appears to have its severer part cast upon her. But it is the boy who is most frequently thus subjected to work to which his strength seems inadequate. He is frequently seen working by himself, but generally side by side with his father—either taking upon himself the lighter parts of the work, or sharing it, without regard to degree, with his father. If the latter apportions to his son the lighter work, he of course increases his own toil, by reserving to himself all that is heavy and laborious. If, on the other hand, he makes his son partake of the general work, whilst his own labour is not thus increased, the task devolved upon the boy is that which is only suitable for the man. In such cases, children are subjected to great hardships—not the least evil of which is, perhaps, the premature age and decrepitude that supervene. But in the majority of cases, although they are kept very constantly at work, they are not severely over-tasked, the parental instinct generally interposing between them and such a result. When the tenderer members of the family are thus not subjected to work beyond their strength, the system of the husband taking task-work, and being aided by his wife and children in the execution of it, seems much more favourable—at least as regards the conservation of morals—than the practice which elsewhere prevails, of each member of a family finding work for himself or herself, where and how he or she can, the husband working in one field, and the wife in another, the son in a third, and the daughter, perhaps, in a fourth, and sometimes under different employers. The system alluded to as prevailing in the hop dis-

tricts has at least the merit of keeping the family together—a state of things more favourable to the exercise of a wholesome surveillance than the opposite practice.

The first business in the cultivation of the hop is of course the preparation of the ground. From this to hop-picking, which is the last out-door process, the hop-garden is the scene of almost constant industry. The ground may be prepared any time before February, when digging commences. The chief preparation is the manuring of the land. For this purpose rags and sprats are used, and, in the absence of these, ordinary manure. Occasionally, different kinds of manure are mixed together, and sometimes all these are combined. When rags are used, they are generally woollen ones, which being composed of animal matter, make a very good manure. Before being used they are chopped very small upon a block, in which state they are fit for use. For chopping the rags a man gets from 12s. to 15s. a week. It is not exclusively men's work, it being such as boys may make themselves very expert in. They, of course, get lower wages than the men. The rags are also generally known as "hospital rags," being, in fact, the refuse of the metropolitan and other hospitals. Many complain of the pernicious results of introducing such a commodity into healthy localities. I have been told that the presence of small-pox in Tunbridge Wells has frequently been attributed to it. Whilst chopping the rags the workmen have often been sickened, and their appetites taken from them, by the offensive effluvia proceeding from them. "We don't like the work very well, but it get us 15s. a week," said one of them, on being asked why he adhered to such an employment, especially after he himself had several times been made ill by it. When sprats are used, they are spread over the land to decompose upon it. When this is done, boys are in requisition to watch the fields and to act as peripatetic scarecrows to frighten away the gulls, which would otherwise come in great numbers from the coast to partake of a repast so temptingly spread for them. For this work a boy will sometimes get 6d. a day, at others not more than 2s. or 2s. 6d. a week. If the rags are objectionable in their way, so also are the sprats. I have been told in some places that the neighbourhood used to be regularly poisoned by the quantities of them which lay decomposing on the ground. They are used in but few places to the same extent now as formerly. The work of digging, with such manure on the ground, must, when the weather is at all warm and the work of decomposition incomplete, be anything but wholesome. Digging is generally the work of men, aided by boys when the work is not day-work. The boys are called in when the work is task-work, and, as such, is undertaken by their fathers. A boy and his father frequently earn between them £1 a week at this work, the boy doing about a third of what the man does, or about a quarter of the whole work done. Digging is, as I have said, generally commenced in the month of February, when a brisk demand for labour succeeds the inactivity of winter throughout the whole of the hop districts.

The hole dug for the reception of the plant is an irregular one, being, generally speaking, about two feet in diameter, and from eighteen inches to two feet deep. It is desirable that the earth about the roots of the plants should be, for some distance around it, as loose and free as possible, and therefore it is that the hole is made of the dimensions specified. The nursery plants are then taken and put into the holes, there being generally but three of them to a hole. Care is taken that their roots are kept free, and that they are well spread out. After this, the mould which has been taken out of the hole is carefully replaced, having been first bruised and well pulverized. In this process the top of the plant is kept a little above the level of the ground, so that a slight hill can be formed around it without smothering it. It sometimes happens that the hop bears the first year, and sometimes the second; but it is generally the third year ere it comes to bearing maturity. If circumstances favour it, the plant is ready about the beginning of the second season to undergo the operation of pruning. The first step in this process is that which is known as "opening the hills." This consists of removing the mould from about the roots of the plants, so as to get as low down as possible at the shoots of the previous season. The older shoots are then cut off with a sharp pruning knife within an inch or two of the stem of the plant, after which the earth is restored carefully to its place, leaving the remaining shoots to grow. The opening of the hills is a species of work common to men, women, and boys; generally speaking, it is the work of men. They are frequently aided at it by the boys—whilst in some places custom, or something else equally arbitrary, has assigned it to women. It is seldom, however, that women are to be found doing this where the ground is comparatively heavy, as is the case around Brenchley and in the neighbourhood of Tunbridge. When the men and boys open the hills, the women generally prune the plants; when the women open them, the men prune. In some places, when the lightness of the soil admits of it, the women are put to the work of opening, because more reliance is placed on the skill and judgment of the men in the work of pruning. In some localities the work of pruning the plants, with its accompaniments, is given out by task; in others it is almost exclusively treated as day-work. When the latter, the men may earn from 2s. to 2s. 6d. per day; and as the women and boys are then hired as independent labourers, they earn—the women from 10d. to 1s., and the boys from 6d. to 8d. a day. When the work is given out by task, the husbandman undertakes to do it, with such aid as he can get—generally that of his family. In such cases, the wages of the women and children are comprehended in the contract entered into by the man, which is usually to do the work at from 3½d. to 4½d. per hundred. The boys begin this work at twelve, when the opening of the hills is very severe labour for them. If they continue at it for two or three years they may, when it is day-work, earn from 10d. to 1s. a day. When the work is given out by the day, the hours of labour are from six to six—hours which must be observed by boys as well as men. Women, in similar cases, work from eight to six, it being supposed that household duties prevent them from coming out at

an earlier hour. When it is task-work they may select their own hours, always providing that they do not neglect their work. Half an hour is usually allowed to the men and boys for breakfast when labouring by the day, and an hour to men, women, and boys for dinner. Although the season of the year in which this process in the cultivation of the hop is attended to is not the most favourable for out-door operations, there are nevertheless circumstances attending it which render it in general a more healthy species of work than others that are performed at more genial periods of the year.

It is when the plant begins fairly to shoot that it undergoes the process of poling. The poles are forced into the ground to a sufficient depth to give them a firm hold. This being a work requiring almost exclusively muscular strength, is commonly assigned as task-work to men. But even in this they derive aid from their families, the women and children frequently assisting in laying out the poles for the men. Boys can be thus employed at a much earlier age than either at opening the hills or digging in the hop-garden. They are not unfrequently thus occupied in the field at eight years of age. They are sometimes hired, when a little older, to assist others, when they earn about 6d. a day.

The remaining operation connected with the hop-garden I shall reserve for a subsequent communication.

THE PRINCIPLES OF MANURING CROPS.

We have not yet by any means discovered the whole of the *principles* of manuring crops. Wont practice has been too long blindly followed. But it is now found to be of no use. The climate —the quality of the soil, mechanical as well as chemical—the aspect—the elevation—and even the crop—are all modifying circumstances, as well as the influence of the geological strata on which the soil rests. Though the latter is often modified by drifts, yet the mechanical character of the soil, as well as the chemical, has much to do with the value of the superincumbent strata. Hence we have arrived at the following deductions, which embrace almost the whole of our knowledge :—

(*a*) The same manure will not always have the same effect either on the same soil for another crop, on another soil for the same crop, or either on the one or the other for any great period of time.

It was a custom in Cheshire, some years ago, for capitalists to take farms; to manure the whole, year after year, with soot; to get great crops; but, ultimately, to leave the farm denuded of its stamina so much as to be almost worthless for years after from simple sterility. This was said to be because the soot was a stimulant and not a manure. But we shall allude afterwards to the elucidation of this principle.

(*b*) On some soils a mineral manure is quite adequate to produce ample crops.

This was so far proved by the theoretical calculations of Liebig, that he suggested a purely mineral theory, and Messrs. Muspratt and Co. manufactured one under his directions, which was an absolute failure.

(*c*) On other soils ammoniacal, or, at least, azotic manures, with or without carbonaceous manure, or the latter alone, will produce better crops than mineral manure, and will alone secure a very full production.

So far did Mr. Huxtable carry this, that he proposed the application of ammonia at a given price as the only panacea for the farmer, and the certain means of growing wheat at 40s. per quarter.

(*d*) On other soils mechanical mixtures will do more to benefit a soil than any manure whatever; in other words, the addition of substances useless in themselves will promote production of crops before impossible to be grown on the land, and will ensure crops of a much better quality and larger quantity.

Thus an application of the coldest and most worthless clay to an equally barren and sterile sand will often constitute a soil of fair quality, if not fit to grow crops at once, at least very fit to receive a small modicum of manure with the greatest possible advantage; or peat upon clay, or marl upon chalk; nay, in fact, nearly every mixture short of sand upon clay, which seems to be of very little service.

(*e*) Phosphoric acid will be, especially in a state of slight fixation, highly beneficial to almost every soil; simply because this is a material of which the whole process of agriculture appears to denude the land.

Thus soils the most worthless, barren peats and blowing sands, are made to grow the finest green crops by the use of vitirolized bones or of guano.

(*f*) A general manure, consisting of ammonia and potash, with a mixture of carbonaceous matter, if in a high state of solubility, will almost invariably produce a moderately good crop in any soil whatever.

This appears to be owing to their enabling the plants to take up their proper quantity of the other mineral matters in the soil, and so afford large leaf-organization for drawing the supplies of the needed carbonic acid gas from the atmosphere.

(*g*) A succession of the same kind of manures will, after possibly a second application, always tend to produce less and less sensible results in improving the crop.

Few manures contain all the elements needed by

plants. Guano seems to be by far the best general manure, but it is quite possible that in time it may be found necessary to apply some other, to keep up the proportions of stamina in the soil.

(*h*) In soils where the manure rapidly disappears, from a want of power to absorb its best qualities, a small and frequent application is preferable to a larger and more remote system of dressing.

When the soil can hold the manure only for a short period, it is manifestly best to give it to the plants in the quantities they can readily assimilate.

(*i*) Manure should always be applied in the degree of fixation most easily dissolved by the soil or the plants. A second application is better than too much at once.

It is manifestly the safest course not to over-tax the vital energies of the plant, to dissolve the manurial medium.

Hence, as a rule, it is far preferable, even at a loss, to allow the manure to ferment, in preference to applying it in the raw state; for though there is necessarily a waste in all decomposition, yet it may be a necessary waste, to enable the plants to realize the dose of manure applied to them.

(*j*) It is abundantly clear, moreover, that of the manures applied the plants do not come in contact with the whole; hence it is necessary to apply more than they absolutely take away, or a deficiency must necessarily take place, and the crops fail. It must be also borne in mind that, in order to make the scale-and-weight application of a compound, the application itself should be in a proper state of fixation.

Experiments have certainly shown that as regards ammonia it seems to matter little whether it is applied as the fixed sulphate or the volatile carbonate. The soil, properly constituted, soon assimilates both in its own special degree of fixation; but it may not be so, and certainly is not so with the carbon which may be applied.

The *drill* is a grand assistance to the small application of manure; but it will not much assist in applications of guano, or similarly powerful and rapidly decomposing materials, but will often injure the soil. Of all manures guano is the most diffusive, and may be, with the greatest possible advantage, mixed with the whole soil. The plants are certain to find it.—Gardeners' and Farmers' Journal.

CHIPPENHAM HUNDRED FARMERS' CLUB.

The first monthly meeting of the season of this Club took place at the Bell Inn, Yatton Keynell, on Wednesday, the 29th September last, presided over by Mr. Thos. Little, in the absence of his brother, Mr. R. D. Little. The ordinary business was first transacted.

Mr. Schneider, Slaughterford, and Mr. Painter, of West Yatton, having agreed to bring forward conjointly, as a subject for discussion at the next monthly meeting, "The best preparation for wheat on light and heavy soils," the CHAIRMAN called upon Mr. Scott, of Grittleton, to introduce the subject for discussion that evening.

Mr. SCOTT then rose and read the following paper:

"WHAT HAS SCIENCE DONE FOR AGRICULTURE?"

In endeavouring to answer the question, "What has science done for agriculture?" I must ask—as I feel confident I shall obtain—your indulgence, from a deep sense of my inability to do justice to the subject, and from the fact of my not having had many days to prepare myself to bring it forward. I must claim your special attention to the remarks I shall make, as it is difficult to bring the facts and arguments of the case into a focus, to enable them to be easily seen and clearly comprehended by the general body of members of clubs such as this, who, however prompt and ready in their practice to avail themselves of the results of scientific discoveries, are not likely to be in the habit of discussing the processes by which they are arrived at. And here I would observe that it can never be reasonably expected that farmers in general should become scientific scholars by studying the abstruse principles of chemistry, or by learning the botanical names of 50,000 plants, that they may cultivate a dozen. All experience is opposed to this, or to their turning aside from that course and from those processes which have been confirmed by the experience of centuries, and in which alone lies their safety. But when farmers know the principles on which their successful practice depends, agriculture then becomes a *science*, and remains no longer only an *art*; and you will all, no doubt, admit that one farmer with a knowledge of science must possess advantages over another without it, both being equal in practical ability. Take as an instance that both parties farm a thin soil, composed of inert vegetable matter, resting on what is called a moor-band pan, which is bound together by sulphate of iron, and discharges that yellow sediment so often seen by you in your ditches, called oxide of iron, so poisonous to vegetable life. Suppose this land to be managed exactly alike, until it come to be fallowed for green crop; then the one applies dung, because he knows it is usual to do so at this stage; but the other—the man of science—applies lime, and ploughs it in, that it may come in contact with the pan below, knowing, as he does, that the lime will liberate the potash and decompose the sulphate of iron, and, by taking up the sulphate, become sulphate of lime or gypsum, thereby affording suitable food for turnips, wheat, and clover. The result in the former case will be almost an entire waste of the manure and a stunted crop of roots.

Until very recently science has been so little recog-

nized as a handmaid to agriculture, and has met with so many rebuffs in its advances, that its progress has no doubt been retarded; so much so, indeed, that though it is many years since "Tull" wrote and "Davy" lectured, it would be much more easy even now to say what science proposes to do, than what it has actually accomplished for our profession. Fortunately, it is now recognised by agriculturists as a body, and those farmers who endeavour to engraft it on their practice are no longer designated "mere theorists." Science never claimed the power to enrich individuals, any more than our Club does—but only to improve our general practice and elevate our profession; and therefore it ought to be encouraged, or, at least, treated with that degree of forbearance necessary to enable it gradually to develope its resources. The facts of science generally, if properly tested by careful experiments and brought before us on high and reliable authority, are not to be put lightly aside, like many of the extravagant theories that start up around us from day to day. But, nevertheless, when we find men, as we too often do, of note and intelligence propagating doctrines as of practical value, such as that lightning and electricity stimulate production, and inducing sanguine farmers to surround their fields with wires to catch it—when we see such men as Professor Liebig giving forth that plants require only an imperceptible amount of mineral food from the soil, the rest being supplied by the atmosphere—and publishing that one of the best manures for land is burnt straw or ground glass, and encouraging farmers to hope that the time had almost arrived when, in place of the cumbrous apparatus of farm yards and dung carts, they would have a laboratory in their fields to manufacture silicates and phosphates—when we find, I say, scientific men giving the weight of their authority to such doctrines as these, we need not much wonder that practical farmers so frequently turn their backs on science, and that its progress amongst them has been so materially retarded. An injurious effect in the same direction has, I think, been unfortunately produced by the expressed views of so many of our great agricultural authorities—such as Arthur Young, Dr. Coventry, Professor Low, and others—all of whom have discouraged the farmer from bestowing much study or placing almost any reliance upon the results of science. I will just read to you Professor Low's remarks bearing upon this point, as he is undoubtedly the soundest instructor in practical farming we have ever had, and the greatest living authority. "It is in Germany and France," he says, "that chemistry and vegetable physiology have been cultivated for the longest period as a branch of agriculture. But when we inquire in what manner these researches have improved the practical art in either country, we have only to consider the nature of the subjects themselves to be assured they cannot have done so in any sensible degree. They are seen to be the mere opinions of learned men formed for the most part in the laboratory and closet, without a due knowledge of the business of the fields, and the modes by which agriculture can be cultivated as a branch of industry. Let us turn again to countries where theories of vegetation have been unheard of, and we shall yet find the art of husbandry in a high state of advancement. In the Netherlands the surface of the country is like a garden, and every available resource has been resorted to for rendering it fertile by the industrious inhabitants. In the North of England and a part of Scotland, a system of agriculture has been established which has multiplied the resources of the country in a great degree; yet in the forming and perfecting of this system physiology and chemistry have had no share. If we turn to the sister art of gardening, which is the child of experiment in every country, we shall find that it has been perfected without the aid of those theories and researches which many hold to be necessary."

Notwithstanding this, I think the many scientific truths which have been floating in the atmosphere around us are now beginning to stick to the agricultural mind, and as the soil is good, I have no doubt they will soon germinate and bear good fruit.

As a proof of their gradual progression, we find the Royal Agricultural Society of England at its formation, about 12 years ago, adopting the motto, "Practice with Science." Liebig soon after published his "Treatise on Agricultural Chemistry," by which he obtained an European reputation. This was followed by the farmers of Scotland subscribing upwards of £2,000 to establish a chemical association in that country, and support a professor at £500 per annum. The Cirencester College did the same, and its professor, Mr. Way, has repeatedly been invited by the Royal Agricultural Society to deliver lectures at its annual meetings, which he has done with great effect. Professor Johnston has also published his popular lectures, and a branch of agricultural chemistry has been established in several common day-schools, and its importance has been recognised in many other ways.

Agricultural chemistry, however, although so prominently put forward, and undoubtedly deserving the first place, must not be supposed to constitute the only physical science bearing upon the interest of agriculture. Geology, botany, meteorology, physiology, entomology, natural history, and medicine, all more or less seek to connect themselves with its principles and practice. So, likewise, may mechanical science claim some credit for its many inventions in aid of the business of farming.

The distinction between *science* and *art* I need not define. You are all aware that science explains the cause of results by a course of reasoning from fixed principles; nay, it takes a higher sphere, and by the same process it *predicts, foretells, and guides*. Art, on the contrary, only executes the edicts and decrees of science. The art must, therefore, in a certain sense, be subordinate to the science of farming. A Watts may have the genius to invent a steam-engine without the practical ability to construct it; so a Napier may possess the talent to construct one, without a knowledge of its principles. Again, a Liebig may know what will produce a certain crop, without the necessary skill to grow it; and a farmer may possess the necessary skill to raise the crop without being aware of the causes which produce such a result. Thus a chemist may be a good philosopher without possessing a knowledge of farming; and a farmer may be a good agriculturist without possessing a knowledge of the theory of production. The one, you

will perceive, partakes more of an intellectual and reasoning operation; the other more of a mechanical.

Both physical and mechanical science have advanced manufactures; and why, let me ask, should their aid not be equally beneficial to agriculture? Until of late years farming operations were guided in a great measure by local experience, acquired by long and expensive courses of practical experiments; and there certainly can be nothing more valuable than the results of experience in farming; but with the aid of science you will be enabled to acquire the same knowledge in less time, and be prevented from taking those false steps which you are apt to do when trusting to experience alone, and refusing the assistance of well-ascertained principles. Had Davy or Liebig lived as contemporaries of Tull, to explain the sound principles which he promulgated but could not defend, those great principles (applicable to all soils and in all climates) would not have lain dormant for upwards of a hundred years, only now to be revived by men whose scientific minds have enabled them to penetrate that theory, which ought to have been yielding incalculable wealth to the country a century ago.

Again, take the case of land drainage, and I think your personal experience and observation will bear me out in saying that nine-tenths of all the drainage done in this country previously to the last fifteen years, or until Parkes elucidated the true scientific principles of draining, has been most imperfectly executed, and that the expenditure was almost entirely thrown away. And here let me remark, incidentally, that though we willingly accord to Mr. Parkes the merit of laying down in his writings the true principles of an efficient land drainage, yet he has unfortunately proved himself to be but an indifferent practical operator when called upon (in consequence of his able writings) to put his principles into practice.

If I may claim your attention for a few minutes longer, I would venture to state a few of the results of chemical investigation. In the first place, it has been shewn by analysis that we can ascertain (with sufficient correctness for practical purposes) what different soils are composed of; as also the elements of plants, and the constituents of manures. We are, therefore, now enabled in our daily practice to supply the soil with those substances in which it is deficient, thus furnishing suitable food to such plants as we may choose to grow upon it. You are all aware that artificial manures are now successfully made through the aid of science, and many of us can adduce cases in which our respected fellow-member, Mr. Proctor, has administered successfully to all varieties of crops on totally different soils. Look to what guano has done, whose value and uses chemists so correctly told before practical trials could be made. As an instance of the value of chemical analysis, take the case of an intelligent and enterprising Lothian farmer, that of Mr. John Dickson, of Saughton, near Edinburgh, who lately purchased from a respectable merchant in Leith several hundred pounds' worth of guano, and had it analyzed by Dr. Anderson, the farmers' agricultural chemist in Scotland, who found it to consist of

Coprolites, worth	£3	0	0	
Gypsum	1	5	0	
Genuine guano	0	15	0	
In all	£5	0	0	
And for which Mr. Dickson had paid	9	10	0	per ton.
Thus showing a loss of	£4	10	0	per ton,

which he detected by means of this analysis, and recovered from the seller upwards of £100.

The process of dissolving bones with sulphuric acid is also due directly to the inductive principles of chemistry, and was first tried by Liebig, because he knew from scientific principles that this process would produce the desired result of liberating the phosphates in bone and making it fit for the food of plants. Having had much experience in the use of bones, I can confidently assert that for general purposes, either as a top dressing or for underground manure, 5 cwt. of dissolved bones, called "superphosphate of lime," costing (in Bristol) 40s., is to be preferred to a ton of raw bones, costing £6.

Again, chemistry has shown that a small brown stone, called a *coprolite*, which is found in abundance in several parts of England and in Spain, and also, I believe, in America, and is said by geologists to be the fossil dung of an antediluvian lizard, is a good inorganic manure, and I have seen it used with success at the Cirencester College Farm.

Chemistry also explains the ingredients which both cattle and crops remove from the soil, and what is required to replace them. Thus milch cows, we know, impoverish the land they pasture on, and analysis shows that the milk they yield contains a large quantity of the phosphates, which is the principal food of grasses and clovers; and when the excrements of dairy cows is examined, it is found to be thus much poorer. From this cause the farmers in Cheshire—the greatest dairy county in England—are constantly restoring those phosphates to the soil by top dressing their pastures with bone dust. Young stock, on the contrary, only remove the quantities of phosphates and other ingredients required to form their bones and flesh, and their dung is so much the richer than dairy cows.

It is now also pretty well ascertained what materials particular crops remove from the soil, and one curious fact is that from an acre of land 10 inches deep and weighing 1,000 tons, 20 crops of wheat, at 35 bushels of grain and 2 tons of straw per acre, only remove of minerals of all sorts 0.248; and it was supposed by Jethro Tull, and now by many even practical men, that nearly all the other elements of wheat may be derived from the atmosphere, by stirring the soil and allowing it to have free access to the plants.

It has now been clearly established by Professor Liebig that the heat of the body, both of man and animals, is the same in all climates and temperatures—that the chief source of animal heat is carbon—and that our food is the great source of carbon. In cold weather, therefore, when the body gives off an increased amount of heat, a proportionate quantity of food will be necessary for our stock, in order to keep up the due temperature of the body. Hence the advantage, nay necessity, of

keeping our *feeding animals* always moderately warm and beyond the reach of cold currents of air, not merely to save food, which the most of us know it will do, but to conduce to their general health. A beautiful fact in connexion with this circumstance is that the oxygen gas which animals are constantly wasting by respiration is again supplied by what is given off from growing plants, which extract carbonic acid gas from the air, retain the carbon, and set the oxygen free, thus maintaining a beautiful law of compensation.

Again, how marvellous the fact that it is within the individual power of any of us to carry to the field sufficient manure, in the shape of superphosphate of lime or guano, for an acre; but it would require an Atlas to bring back the crop that such manures would produce.

See then, in these facts, the realization of what science predicted fifty years before such things were thought possible. And had Lord Kames lived in our day, his memorable remark that the time would come when a farmer might carry as much manure in his hat as would suffice for an acre of land would not have subjected him to the witty and sarcastic retort that he would be able to bring home the crop in his waistcoat pocket! For the rapid strides that science has made within the last ten years—the extraordinary discoveries that have taken place—the increasing mastery of mind over matter, making nature reveal, as it were, her inmost secrets—leave no man at liberty to dogmatize of the future. It looks, indeed, as if we had, at last, found a key to unlock the boundless storehouse of nature; and he only, who from time to time heaves the log into the deep, can fully appreciate the strength of that vast intellectual current that is sweeping along with such irresistible power.

I have dwelt so long on chemistry that I will only add that geology indicates the kinds of crops and stocks most suitable to a district; botany—the plants, their sexes and habits. And here let me remark on the beauty and peaceful influence of that science whose votaries are to be found in all parts of the habitable globe, in the deserts of Africa, in the wilds of America, and amongst the distant islands of the Pacific, the pioneers of peace and good will amongst nations, and constantly returning to enrich their native land with their newly discovered treasures.

Meteorology has given us the barometer and thermometer, and taught us the signs of the weather, and the effects on climate, of draining, planting, and cultivation.

Physiology teaches us the structure of animals and plants.

Entomology the habits of insects, by which we may sometimes ward off their destructive depredations, or destroy them.

On the continent this subject commands the attention of governments. In France, Germany, and Belgium local laws are from time to time enacted for the destruction of insects; and commissioners are appointed to investigate their economy, and to suggest plans to arrest the evils arising from them, and in many cases efficient means have been devised to stay the mischief. The ready manner in which insects may be imported from foreign countries with our grain, and naturalised here, and the fact that such has been the case in many instances, ought to make us more alive to this subject, and induce us to be more attentive in keeping our barns, storehouses, and granaries clean and well aired.

Natural history enables us to know the habits of the birds and animals that frequent our fields, and their good or evil propensities, and may sometimes induce us to mitigate our unqualified condemnation of the persecuted, but nevertheless useful rook.

Medicine can give us enough skill to enable us, in emergencies, to administer to the ailments of our dependent animals.

And lastly, mechanical science has conferred upon us inestimable boons; for who can reflect on the improved ploughs now in use without thinking on James Small, the working blacksmith? or on the thrashing machine, without a feeling of gratitude to the humble Scotch mechanic, Andrew Meikle? or on the now all but perfect reaping machine, without esteem for the labours of the Rev. Patrick Bell, and acknowledging that we owe something to mechanical ingenuity and science? So, also, has it given us the steam engine, to thrash and winnow our corn, and then to carry it to market and bring back the master-farmer manure. And its most recent production, Fowler's draining plough, is not unlikely to work a great change in draining, in cultivation, and in climate; for I can confidently say, from a personal knowledge of its construction and practical operation, that it is not a mere rude machine to be dragged along by brute force, but one constructed on strictly scientific principles to reduce the power of draft and resistance, and to produce the desired action on the soil.

A liberal knowledge of science, then, must make a farmer a more unprejudiced man. It will connect the every-day business of life with a higher class of thoughts and feelings; it will enable him more clearly to comprehend the details of his farm, and so bring the whole into that more perfect harmony by which every operation shall conduce to one common end, with the least expenditure of power and the greatest produce of result; and therein, I conceive, consists the true art of scientific farming.

A discussion followed, in which the chairman, Mr. Schneider, of Slaughterford, Mr. Painter the secretary, Mr. E. Little and others took part; and we are happy to be able to add, that although those present were unanimous in considering practical experience as the safest guide, they were equally so in showing a due appreciation of the principles of science.

The following was the resolution come to:—

Resolved,—That physical and mechanical science have rendered and continue to render valuable services to practical farming; and that, though a knowledge of science is not considered indispensable to a farmer, yet such an acquaintance with chemistry, geology, botany, meteorology, and mechanics, as can be acquired by the ordinary habit of reading and observation, is desirable, and would be found a valuable addition to practical experience.

AUTUMNAL SALES OF SHORTHORNS, &c.

The following highly important sales of stock took place this autumn, under the direction of Mr. Strafford, auctioneer, of London, the well-known active and intelligent Editor of the Herd Book, the "Burke" of the Shorthorned Peerage:—

Ribbleton Hall, Aug. 27.—The stock of Thomas Birchall, Esq., had so long enjoyed an enviable celebrity that we were prepared to find a numerous attendance of buyers at his sale of pure shorthorned cattle, and the number and high standing of the gentlemen present was such as is seldom witnessed at a sale in this county. The result of the sale was highly satisfactory, the competition for some of the animals being exceedingly sharp. One gentleman, Mr. Tanqueray, who purchased six of Mr. Birchall's stock last year, had been so highly pleased with them, that he commissioned a party to purchase others of the same blood, the agent making five purchases. Our space compels us to select only a few of the animals sold. Beginning with the cows, we have Dorothy Gwynn, roan, now ten years old, fetching no less than 60 gs.; Beeswing, roan, calved Jan. 8th, 1845, fetched 42 gs.; Batwing, roan, May 5th, 1847, 36 gs.; Hyacinth, roan, June 10th, 1847, 36 gs.; Honeycomb, dark roan, Sept. 25th, 1849, 46 gs.; Nectar, roan, Jan. 20th, 1851, 36 gs.; Polly Hopkins, roan, Feb. 25th, 1851, 31 gs.; Cynosure, dark roan, March 2nd, 1851, 40 gs.; Ann, red and white, March 9th, 1851, 37 gs.; Queen Bee, roan, Jan. 3rd, 1852, 45 gs.; Jessamine, dark roan, Feb. 20th, 1852, 31 gs. In bulls, the Duke of Lancaster, who figures in the prize list in another column, fetched 61 gs. (purchaser, Mr. Lord, Standish Hall), he was calved Oct. 4th, 1848; Richmond, roan, Sept. 24th, 1851, 33 gs.; Sting, red, Jan. 22nd, 1852, 45 gs.; Pantaloon, red, March 18th, 1852, 26 gs. The farming stock, horses, and implements, also sold well. Mr. Strafford, of London, officiated as salesman with his accustomed talent. C. P. Grenfell, Esq., purchased the bull Richmond and the yearling Moonbeam. The total amount realized by the sale of horned cattle alone was about £1,125.—Preston Guardian.

Watkinson Hall, near Halifax.—This great sale of some of Mr. H. Ambler's pure-bred shorthorned cattle took place on Wednesday, September 8, in a croft adjoining the farm buildings. The sale excited great interest, not only in the neighbourhood, but amongst the agriculturists of the entire kingdom—buyers attending from various parts of England, ranging from Cornwall to Cumberland and Suffolk, as well as from Ireland and Scotland. There was also a large attendance of the gentry and farmers of the district, to whom so large a sale of first-rate cattle with pedigrees (carried back in some cases to ten and twelve generations) was an event of perfectly novel occurrence. As Watkinson Hall is upwards of two miles from Halifax, luncheon was provided by Mr. Ambler for almost every visitor. The large room over the stables was fitted up from end to end with two long tables, which were most abundantly stored with edibles, provided with a truly baronial hospitality, and washed down by the guests with unlimited supplies not only of "home-brewed," but also of wine. Occupying the post of honour on one of these tables was a well-cooked baron of beef, weighing 176lbs.; and along the room (which was decorated with evergreens) was displayed the motto, "Agriculture and Commerce"—a happy combination of the two prime sources of England's prosperity, which Mr. Ambler has exemplified in his own practice in a manner which has made him already known to the entire kingdom. There was also, for the gentry attending this sale, a more superb and sumptuous provision made at Watkinson Hall; the good lady of Mr. Ambler rivalling in the *recherche* character of her entertainment for the more distinguished guests, the munificent provision made for the general public. Amongst the gentlemen attending this great sale we noticed—F. H. Fawkes, Esq., Farnley Hall; E. Akroyd, Esq., Denton Park; Rev. J. D. Jefferson, Thicket Priory, York; M. Stocks, Esq., Catherine House; J. Sugden, Esq., Keighley; J. C. Sutcliffe, Esq.; Lee Royds, Esq., Rochdale; J. S. Rawson, Esq.; W. Heaton, Esq.; E. N. Alexander, Esq.; Dr. Kenny; Mr. Logan, agent for Lord Londesborough and J. M'Donald, Esq., York; the agent of Benjamin Haigh Allen, Esq., of Longcrofts Hall, near Lichfield; Mr. Baxter, agent for Adam Dugdale, Esq., Burnley; Mr. Peacock, Haddockstones, near Ripley; Mr. Patterson, Hall Beck, Ulverston; Mr. J. G. Wood, Castle-grove, Letterkenny, Ireland; Mr. Tyarke, Merthen, near Falmouth; Mr. James Sibson, Carlisle; Mr. John Shaw, Hyton, near Bootle; Mr. J. Booth, Cotham, near Newark; Mr. J. Todd, Mireside, near Wigton; Mr. Smith, agent for Sir E. S. Gooch, Bart., M.P., Suffolk; Mr. Mason, agent for Sir C. Tempest; Mr. Wetherell, Durham; Mr. J. Booth, Killerby; Mr. R. Booth, Warlaby; Mr. J. Hall, Kiveton Park; Mr. Smith, The Grove, near Bingham, Notts; Mr. Eastwood, agent for C. Townley, Esq., M.P.; Mr. E. Whittaker, Burley; Mr. Lindow, Whitehaven; Mr. J. Hannam, Kirk Deighton, Wetherby; Mr. J. Holdsworth, Birkby Lane. On taking his stand upon the rostrum, Mr. Strafford, the auctioneer, after stating the conditions of sale, observed that, in reference to the character of the stock, it was sufficient to say that it was bred from the herds of Lord Carlisle, Lord Burlington, Lord Ducie, Mr. Bates, Mr. Carruthers, Mr. Fawkes, and others. The cows had been served by the Duke of Richmond (a bull bred by the late Mr. Bates, of Kirkleavington, from his celebrated Duchess tribe), by Senator, with which Mr. Ambler had won the Royal Agricultural Society's first prize at Exeter, in 1850, and its local prize in 1848, by Broker, the son of Usurer (which had sold for 400 guineas), by Lord Byron, and other bulls alluded to in the catalogue;

and that the milking properties had been carefully attended to. They were also of good colour; for 54 out of the 100 animals he had to sell that day were roans. This sale showed the triumph of the motto of the luncheon, "Agriculture and Commerce" united; and he knew no more powerful element than this in the improvement of the breed of shorthorns. Mr. Ambler had performed great wonders in the few years he had been a breeder. He (the auctioneer) had seen this place a few years ago, and now found it wonderfully improved; the land seemed doubled and trebled in value. In conclusion, the auctioneer assured the company that the sale was most unreserved; not one shilling would be bid for Mr. Ambler, directly or indirectly. The sale then commenced. Many of the older cows went for comparatively low prices; on "Miss Frances" coming into the ring, however, her beauty and breed excited a universal murmur of admiration. The auctioneer informed the company of the well-known fact that she was the winner of about twenty prizes. The biddings commenced at 50 gs., but at first rose very slowly. The glass (a sand-glass used by Mr. Strafford, in lieu of the old unsatisfactory system of "once, twice, thrice") went up at 65 gs.: but the biddings then rose to 70, 75, 80, &c. At 100 gs. the glass again went up, and just literally at the last sand Mr. Baxter bid 105 gs., for which sum she was sold to him on behalf of Mr. Adam Dugdale. The cows and heifers in calf (sixty in number) fetched altogether 1,404 gs. The sale improved in the young stock; and for "Gem," a beautiful creature only sixteen months old, there was a closer and more prolonged competition than for "Miss Frances:" she was ultimately sold to Mr. Baxter for 100 gs. The young bulls were bought also much more spiritedly than the old ones. The 100 head fetched altogether £2,328 18s. A stock of choice poultry was then sold; but at so late a period of the day as not to fetch very great prices. Mr. Sugden gave £5 15s. for the two fine hens and a cock of the Cochin China breed, which won the prize at the Halifax show. The poultry (50 lots and 134 birds) fetched altogether £48, making the gross proceeds of the sale £2,376 18s. —Halifax Guardian.

[Since the above was in type, we have learnt that "Miss Francis" and "Gem" have been purchased by Charles Towneley, Esq., Towneley Park, as an addition to his splendid herd.—Ed. Far. Mag.]

Small Bridge, near Bures, Suffolk.—On Wednesday, September 15, the stock, comprising Suffolk horses, shorthorned cattle, Southdown sheep, pigs, implements, and other effects of the above farm, the property of George Wythes, Esq., was submitted for sale by auction. There was a very large and highly respectable company of gentlemen from various parts of the kingdom. Many, no doubt, were attracted by the high character of the farm and premises, which have recently been erected by Mr. Wythes at a considerable outlay, and in a very superior style. For the horses the competition was very keen, ranging from 48, 40, 38, 37, 36, and 26 gs.; foals, from 10 to 20 gs. each. The shorthorns sold tolerably well, the highest price being 30 gs. For the sheep the biddings were quick and spirited; ewes ranged from 38s. 6d. to 32s. each. The pigs also realized good prices, as well as the implements; but the day proving inauspicious, particularly towards the close of the sale, interfered with the latter. Luncheon was served up in the spacious barn by Mr. Chaplin, of Colchester, in good style; and the whole arrangements of the sale were highly creditable to Mr. Jackson, the representative of Mr. Wythes, who has had the management of the above farm, which has been recently let to Mr. Hawkins.

Burghley Park.—On Tuesday, Sept. 28, in Burghley Park, a choice selection of young bulls and cows and heifers, the property of the Marquis of Exeter, were sold by auction. Notwithstanding the unfavourable weather, nearly 150 of the leading agriculturists and graziers of the neighbourhoodattended. The stock sold brought satisfactory prices.

Fawsley Park, Northamptonshire.—On Wednesday, Sept. 29, the third periodical sale of shorthorned bulls, bred by Sir C. Knightley, Bart., at Fawsley Park, Northamptonshire, brought together a numerous and highly respectable company of gentlemen from various parts of the kingdom, and the prices obtained are sufficient evidence of the high estimation in which these sales have been conducted, as well as the character of the stock offered. Fifteen bulls and bull calves realized £712 19s., averaging upwards of £47 10s. each. The highest price was Cardinal, at 16 months, 92 gs., bought by Mr. Robinson, of Clifton Hall, near Olney. Magician, at 19 months old, sold to Mr. Fisher, near Spalding, for 81 gs.: Trojan, 12 months, to Mr. Thursby, for 70 gs.; Flimnap, 7 months old, to Mr. S. Bennett, for 64 gs. Several others realised good prices. The other purchasers were Earl Spencer; Lord Southampton; J. Du Pre, Esq., M.P.; J. B. Stanhope, Esq , M.P.; George Drake, Esq., Shardeloes, two lots; — Aris, Esq.; J. Beasley, Esq.; Messrs. L. Cowley, Heming, and Hutt.

Rothersthorpe, near Northampton.—On Friday, October 1, the entire herd of shorthorns and a few valuable hunters and nags, late the property of Mr. W. D. Manning, deceased, were sold by auction at Rothersthorpe, near Northampton. The attendance was very numerous: seldom have we witnessed so highly respectable a company at any sale in the south of England for this description of stock, which were offered in a perfectly natural state of condition, not having been forced for the occasion. Indeed, as explained by the intelligent auctioneer at the opening of the sale, the young stock had not been sufficiently attended to, which the illness of their late owner accounted for—to whose memory he wished to pay a tribute of respect for producing so fine a herd, the more so as a tenant-farmer. The sale realized upwards of £1,800, the shorthorns averaging nearly £30 each. Cows ranged from 65, 52, 50, 47, 45, 42, 40, 37, to 35 guineas each. Heifers, 40, 37, 35, 32, 30, 26, to 25 gs. each. Heifer calves, 35, 28, 26, to 25 gs. each. The highest priced bull was bought by Sir

George Robinson, for 49 gs.; a chesnut hunter, nine years old, sold for 80 gs.; and a favourite nag, six years old, for 51 gs. The principal buyers of the higher-priced lots were Sir George Crewe, Bart.; Messrs. Ambler, Rawson, Tanqueray, and Thursby, as well as Messrs. S. Bennett, J. H. Langstone, M.P., Clarke, Ladds, Elmere, Pell, Twitchell, Sagar, Yorke, &c. The day proving fine, gave additional interest to the proceedings.

IMPORTANT SALE OF AGRICULTURAL STOCK IN DEVON.

A very important sale of agricultural stock came off on Thursday, the 23rd of September, at Kelland Barton, Lapford, Devon, on which day the proprietor, Mr. John Moon, through the instrumentality of the celebrated auctioneers, Messrs. Hussey, offered to public competition a large collection of Leicester sheep, Essex pigs, Devon cattle and horses draughted from his well-known stock. Mr. Moon's reputation as an agriculturist, coupled with the fact of his success as a competitor at the Bath and West of England cattle show, at Taunton, and the Royal Agricultural Meeting at Lewes, in the present year, led many to expect a large attendance, but the most sanguine were not prepared for the gathering that took place. The good people of Crediton were surprised to see so many strangers, for as each succeeding train arrived at the station, vehicles of all descriptions, from the stage coach, hired for the purpose, to the more humble omnibus, were in request, and these, with numerous private carriages and equestrians, gave an animated appearance to the Barnstaple road from Crediton to Lapford. Many visited the farm early in the morning, and were much interested by an inspection of the animals. The sheep and pigs were greatly admired. The former were arranged in a field near the house, penned in lots of five each, and at the higher end of the same field twenty-five sows, with their black and shining skins, grubbing together on mangold wurtzel, the growth of 1851, presented such a happy family as is rarely seen. Many an opinion was hazarded as to the prices they would fetch, and at intervals the company, which was fast increasing as the day advanced, examined the high state of cultivation to which this well managed farm has been brought, and inspected the animals which the proprietor had evidently reserved for future honours. A flock of breeding ewes was particularly noticed, as were also two remarkably fine rams, which had been personally selected by Mr. Moon, within the last ten days, from Mr. Cresswell's celebrated stock in Leicestershire.

We must not forget to mention that the in-door arrangements were of the most substantial kind. A bountiful supply of Devonshire fare was provided for the company, which amounted, at the time of the sale, to nearer one thousand than five hundred persons. The arrangements were excellent.

The result of the sale was as follows:—

The draft of eighty store ewes was first put up in lots of five each—and these were sold at prices ranging from 50s. to 76s. per head, to the following gentlemen:—The Rev. Mr. Wright, Messrs. Norris, Dennis, Palmer, Luxton, J. Tanner Davy, Smith, W. Risdon, G. Wills, and T. Palmer.

Pigs.—(Fisher Hobbs' Improved Essex Breed).—There were twenty-five lots; the first, a two-year-o'd sow, was sold to Mr. Sanders for £15 15s.; second, one three-year-old ditto, to Mr. Croote for £31 10s.! and a ten months old sow to Col. Hood for £11 0s. 6d.; a ditto to the Rev. C. T. James, of Ermington, for £11 11s.; a ditto to the Duke of Bedford for £7 17s. 6d.; a ditto, eleven months old, to the Rev. C. T. James for £18 7s. 6d.; a ditto, fourteen months old, to W. Hooper, Esq., of Exeter, for £11 11s.; a ditto, seven months old, to Mr. Lane for £5; a ditto, ditto, to Mr. W. Ballstone for £4; a ditto, ditto, to Mr. H. Lear for £4; a ditto, eight months old, to Mr. Dennis for £5 5s.; a ditto, four months old, to Mr. John Wippell for £7 7s.; a ditto, ditto, to Mr. Hewes, of Grafton-street, Dublin, for £8 8s.; a ditto, ditto, to Mr. R. Mortimer for £6 6s.; a ditto, three months old, to Mr. John Bodley for £4 2s. 6d.; a ditto, ditto, to Rev. Samuel Davis, of Burrington, for £4; a ditto, ditto, to Mr. Cole for £3 10s.; a ditto, ten months old, to G. Turner, Esq., for £6 6s.; a ditto, ditto, to Mr. Dennis for £4 4s.; a ditto, twelve months old, to Mr. Anstey for £5 10s.; a sow and seven pigs, to Rev. G. Barlow for £7; a sow, four months old, to Mr. R. Mortimer for £3 12s. 6d.; a ditto, ditto, to Mr. J. Tanner Davy for £15 10s.; a ditto, three months old, to J. H. Terrell, Esq., for £4 4s.; a ditto, ditto, to Mr. G. Wills for £5 5s.

Boar Pigs.—"Don Juan," was sold to J. N. Fellowes, Esq., for £26 5s.; "Snowdrop," to G. Turner, Esq., for £13; a seven months old boar to Mr. Brailey for £5 5s.; a ditto to W. A. Dene, Esq., Torrington, for £14 3s. 6d.; a ditto to Mr. T. Risdon for £5 5s.; a ten months old boar to E. Archer, Esq., for £10 10s.; a four months old ditto to Mr. J. Tanner Davy for £17 6s. 6d.—there was a spirited competition for this animal; a ditto to Mr. R. Mortimer for £8; a ditto to Rev. Mr. Melhuish for £4 10s.; a three months old boar to Col. Hood for £7 15s.; a ditto to Mr. Smith for £4; a two months old boar to Mr. Wright for £3; a ditto to Mr. R. Lear for £1 10s.

The company separated highly delighted with the day's proceedings, and were unanimous in expressing a hope that the spirited proprietor would relinquish the thought of disposing of this magnificent estate, and leaving the neighbourhood, which he contemplated a short time ago, but that he would remain among them, and continue the breeding of those splendid animals, which had been the admiration of all on that day.—*Western Times.*

CALENDAR OF HORTICULTURE.

Plant-Houses.

The whole stock of Chrysanthemums intended to bloom for in-door purposes should now be removed under glass. An empty vinery, where there is no fruit, is a very good place to put them in. Some of those which were early placed under glass will be ready to expand, and may be taken at once to the Conservatory, and their places supplied with some of the later stock. Let them now be very liberally supplied with liquid manure, alternately with clean water. Where the buds are showing too thick, pick out a few of the weakly ones. Apply abundance of ventilation to them in the day, and also all night when the weather is mild. See that Pelargoniums are not saturated with water Keep such as have been recently shifted in a slow growing state: earlier plants, which have made a good growth, must be en-

couraged to go to rest for a time—this is best effected by withholding water, and a cool, dry temperature. Pot-off late-struck cuttings, and encourage them to root by the application of a gentle bottom-heat. Those potted a few weeks back, and subjected to the above treatment, will now be rooted, and must be gradually hardened off. Pot-off the earliest-sown seedlings, and place them also on a gentle bottom-heat. These may be kept gradually growing all the winter. Prick off smaller seedlings into pans. Seed may be sown now to flower late next year, but I would prefer February. Air very abundantly the whole stock, and be careful to avoid a damp atmosphere and drip, both of which contribute greatly to a spotted foliage. Continue to pot-off the strongest plants of the early-sown seedling Calceolarias; the first potted will be rooted out, and should be removed to a cold pit. Examine the old stock, and such as are well rooted out may have a shift. Remove at the same time any straggling shoots, and put them in as cuttings, on a gentle hotbed. See that the drainage is very perfect, as they will require to be freely watered, now their season of growth has commenced. Let them have occasional fumigations, to keep down thrips and green aphides, both of which are very destructive to this class of plants. Sow seed for late-flowering and border purposes next year, in pots or shallow pans. Place a very thin layer of silver sand on the top of the soil, press it down gently to a perfectly level surface, and on that sprinkle the seed, and water with a very fine rose, but do not cover the seeds. Place the pots in a shady part of the cold pit, until the seeds have well germinated, when they must be gradually inured to more light. This tribe of plants requires all the air possible in favourable weather. Let the earliest Cinerarias have plenty of room to develop themselves: keep them near the glass, and encourage a stocky growth by free ventilation. Another portion of the stock may now be shifted for successional blooming. If any of the old plants have been kept back for very late blooming, they had better now be shaken out, divided, and potted. Give them a free open soil, not too rich, and plenty of drainage.

Forcing-Garden.

Pineries.—Attend to previous directions with regard to the necessary shiftings, waterings, and the regulation of the bottom-heat, together with that of the internal temperature, observing that both bottom and top heat must be gradually lowered as the days decrease in length, and the external temperature becomes permanently lowered. No attempt at a high temperature will ever be successful at this season, for however we may stimulate the roots and leaves, without the agency of the potent element light, it must fail, because the plants cannot, as it may be called, digest their food, and hence, therefore, it is necessary to apportion the amount of stimulation to their capacity for receiving and converting it to the purposes of preserving their vitality through the dormant season. The temperature, however, must be assimilated in some degree to the state of forwardness of the plants. Fruiters may be safely allowed from 5 to 8 more degrees, both by day and night, than succession plants will require. Temperature for fruiters—75 deg. maximum by day, 64 deg. minimum by night; succession and nursing plants, 68 deg. maximum by day, 57 deg. minimum by night. Air must be freely admitted, particularly to succession plants and the early fruiters, in order to solidify the growth. In fine weather this will not be difficult to manage; but under unfavourable circumstances out of doors, it will be as well to put on a little extra fire-heat in the morning, so as to require a free admission of air to keep the temperature down. On bright days, shut up as much solar heat as possible.

Vineries. — Continue the necessary prunings and dressing of all vines which have matured the wood: later vines carrying fruit will not matter much for a week or two; but even with them, as soon as the leaves begin to turn colour and fall, it will be better to prune every shoot back to the fruit, and afterwards make it a rule to shorten each shoot finally as the fruit is cut; but in the case of vines to be again started in January or early in February, pruning ought to be done at once, to give the wounds time to heal over, and the vessels to contract, so as to prevent bleeding when the sap begins to flow. Of course all vines to be started next month have been pruned, as directed some time back; and if not washed or rather painted over with the mixture for vines, let them have a first coat at once, and another when the house is finally closed, which it should be ten days or so before fire-heat is put on.

Beds should now be thrown up with prepared fermenting material, in which a great proportion of leaves have been incorporated, for forcing Asparagus: take care not to put the roots in until the fierce heat has subsided; prepare fermenting materials for a succession, according to the supply required. A portion of Sea Kale may also be covered with leaves and dung, but be very careful of too much heat. Young hands very often steam the roots, almost before they think the heat is up. If roots are very plentiful, Sea Kale may be very nicely forced by potting it very thickly in large-sized pots, and inverting a pot of the same size over the crowns, and placing them under a stage, or in any dark, out-of-the-way place, in a heated structure. Rhubarb may also be started in a similar manner, in pots, if required very early.

Kitchen-Garden.

Remember that the earliest Endive already tied up for blanching will not bear much frost, or continued wet weather; and as there will now be plenty of Melon frames at liberty, they offer a very good medium for affording such kinds of plants the shelter necessary for their preservation. Place the frames on a sheltered south border, and put in six or eight inches of light soil. Take up the Endive when quite dry, with a little ball of earth, and plant them thickly in the frames; put the lights on, but tilt them front and back in open weather—in severe weather put on double mats. Late autumn Lettuce should be treated the same way. Take care that there is a good breadth of Lettuce planted out, on a south border, to stand the winter. Select a few of the very strongest plants, and put them in close to the base of a south wall in rich soil; they will come in a fortnight before the others. Keep the surface-soil stirred amongst the beds of winter Spinach, and other advancing crops. Clear and clean Asparagus beds, remove a portion of the top-soil, and apply a good dressing of rich manure.—C.

METEOROLOGICAL DIARY.

Day.	Barometer. 9 a.m. in. cts.	Barometer. 10 p.m. in. cts.	Thermometer. Min.	Thermometer. Max.	Thermometer. 10 p.m.	Wind and State. Direction.	Force.	Atmosphere. 8 a.m.	2 p.m.	10 p.m.	Weat'r.
Sep. 23	30.42	30.44	49	68	52	W. by South	gentle	cloudy	sun	fine	dry
24	30.44	30.38	46	65	48	Easterly	gentle	fog	sun	fine	dry
25	30.27	30.05	46	67	50	Easterly	gentle	fog	sun	hazy	dry
26	29.93	29.92	46	62	54	N. East	gentle	fog	sun	cloudy	dry
27	29.91	29.75	46	63	54	E. by South	movng	fog	cloudy	cloudy	dry
28	29.44	29.00	52	60	52	S. by E., S.	varibl.	cloudy	cloudy	cloudy	rain
29	29.20	29.30	50	57	48	S. S. W.	brisk	cloudy	cloudy	fine	rain
30	29.46	29.70	46	56	47	S. S. W.	strong	cloudy	sun	cloudy	dry
Oct. 1	29.55	29.50	42	56	49	S. by West	brisk	cloudy	sun	cloudy	dry
2	29.37	29.50	44	56	45	W. S. W.	brisk	cloudy	cloudy	fine	shower
3	29.71	29.85	42	57	45	Westerly by S.	airy	cloudy	sun	fine	dry
4	29.81	29.05	40	54	51	Sthly. by W.	forcibl.	cloudy	cloudy	cloudy	rain
5	28.96	29.44	47	57	46	West by N.	lively	cloudy	sun	fine	dry
6	29.52	29.73	41	50	40	Wstly. to N.W.	gentle	cloudy	cloudy	fine	rain
7	29.73	29.92	41	51	40	Wstly. to N.W.	gentle	cloudy	sun	fine	dry
8	29.91	29.89	33	46	37	Wstly. to N.W.	gentle	cloudy	sun	cloudy	dry
9	29.96	29.97	31	51	34	Wstly. to N.W.	breath	fine	sun	fine	dry
10	29.98	30.00	35	55	42	Wstly. to N.W.	gentle	cloudy	sun	fine	dry
11	30.04	30.20	41	54	43	N. by W. by E.	calm	fine	sun	fine	dry
12	30.32	30.38	35	54	38	N. N. E.	lively	fine	sun	fine	dry
13	30.36	30.33	37	54	45	N. N. E.	gentle	cloudy	fine	cloudy	dry
14	30.32	30.26	45	55	45	E. by North	lively	cloudy	cloudy	fine	dry
15	30.30	30.23	45	53	44	E. by North	lively	cloudy	fine	fine	dry
16	30.23	30.22	41	52	40	Easterly	lively	cloudy	fine	fine	dry
17	30.21	30.13	34	53	41	E. by South	gentle	fog	fine	hazy	dry
18	30.19	30.31	42	54	40	North	very gl.	fog	sun	fine	dry
19	30.44	30.44	36	54	42	N. W. by N.	very gl.	fog	sun	fine	dry
20	30.35	30.20	35	56	41	S. Westerly	gentle	fine	sun	fine	dry
21	30.05	29.93	39	60	52	S. Westerly	gentle	cloudy	cloudy	cloudy	dry
22	29.83	29.70	49	61	58	S. S. E.	calm	cloudy	cloudy	cloudy	rain
23	29.69	29.70	—	58	47	S. by East	varibl.	fine	fine		rain

ESTIMATED AVERAGES OF OCTOBER.

Barometer. High.	Barometer. Low.	Thermometer. High.	Thermometer. Low.	Thermometer. Mean.
30.61	28.74	66	27	48.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
56.42	41.86	49.14

Weather and Phenomena.

September 23—Almost calm; sunny, green, and golden stripes, and cirrus at sunset. 24—Eastern change; hazy at times. 25—Sunny day; misty evening. 26, 27—Fogs, terminate in clouds. 28, 29—Become rainy. 30—After rainy night, fine day.

Lunation.—Full moon, 28th day, 6 h. 28 m. morning.

October 1—Rain in night; brisk day. 2—Wet night, gleams, and showers. 3—Keen, lively day. 4—Many hours' driving rain. 5—Lively; very drying wind. 6—Wet forenoon; copper-tinted rolling masses at sunset. 7—Rain last night; fine day. 8—Chilly, but finer. 9—First frost. 10—Milder; some warm sun. 11—Serene; smoky clouds. 12—Beautiful; chilly after sunset. 13, 14, 15, 16—Very equable; more clouds; air lulls at sunset. 17—Cold fog, clearing to a brilliant day. 18, 19—Same as 17th. 20—Fine hot sun; black strata at sunset. 21—Overcast; a hint of rain; warm and genial. 22—Wet overnight; close. 23—Again wet and showery, with some gleams.

Lunations.—Last quarter, 6th day, 10 h. 36 m. morning. New moon, 13th day, 7h. 14m. morning. First quarter, 19th day, 11 h. 56 m. night.

Remarks connected with Agriculture.—The weather, fine upon the whole, though fitfully wet in the extreme, has produced its effects. Ploughing has proceeded admirably, and some young corn (rye) is up. Mangold is a striking crop of this autumn—very abundant, and to appearance productive. Turnips and swedes may be less so than the moist state of the ground might have led one to anticipate; but the average temperature has been several degrees lower than the usual estimate. We hear of disease among stock in some places. Store sheep and lambs, owing to the abundance of food, fetch an extraordinary price; and dealers appear little anxious to sell. Hops are peculiarly fine.

Croydon, Oct. 23rd. J. Towers.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR OCTOBER.

On the whole, the weather of this month has been seasonably fine, notwithstanding that the wind has been extremely changeable, and that we have had successive days of moisture. In most of our agricultural districts, large breadths of land have been ploughed up, and prepared for wheat, the cultivation of which does not appear to be on the decrease, although prices continue to rule low. The quality of the new crop is still much complained of, especially by the southern and midland growers. North of the Humber it is proving extremely fine, both in weight and general condition; whilst the acreable yield is nearly, or quite, up to last year. Many of the samples shown at Mark Lane have exhibited unmistakable signs of the damage sustained by a portion of the crop. For instance, low qualities have sold as low as 30s. per qr.; whilst the finest parcels of white have realized 54s.; hence, it follows that the averages must be greatly influenced for some time, unless, indeed, the losses have been greatly overrated. The new barley is turning out extremely well, both in point of weight and colour; hence there appears to be every prospect of the markets being well supplied. Up to the present time, the quotations of all kinds have been high compared with wheat, and it is possible that they will continue so during the greater portion of the malting season, arising from the moderate yield of Saale qualities. Oats are a heavy crop; but both beans and peas are very deficient.

The immense amount of immigration into the Australian colonies, and the neglect of most agricultural pursuits, have given rise to a variety of speculations in reference to the future supply of food for the additional population. One of our contemporaries has drawn a most alarming picture of what may be expected, and urges the necessity of an export of flour from this country to meet the wants of the immigrants; but at present flour will not pay as an article of commerce, and, in the event of any necessitous wants arising, the American shipowners are sure to take advantage of a new market. Besides, South America produces large quantities of wheat and other grain of very fine quality, and at a much cheaper rate than either here or in the United States. We do not, therefore, anticipate any movement in "breadstuffs" here to meet the wants of the Australian markets.

Potato raising and storing have been extensively carried on, and the result undoubtedly is that a large portion of the crop has been lost. The actual deficiency, however, is not so extensive as some parties have estimated it; still we are apprehensive that the root will not keep well during the winter, because it is evident that, whatever care may be taken in the selection of good sorts for storing, diseased samples will get mixed with the sound ones, to the detriment of the entire supply. The arrivals from abroad have been liberal, about 2,000 tons having arrived during the month; and we learn that large parcels have yet to follow. The best York kidneys have produced 120s. per ton.

The growth of hops is now secured, and a finer produce was never known. The duty has been estimated as high as £260,000; nevertheless, a very large business has been doing in all kinds, at fair prices. Prior to picking being commenced, brewers and others held scarcely any stocks, and the high rates demanded for the limited supplies shown in the Borough, in the face of a high estimated duty, induced great caution in making purchases. Choice East Kents have sold at £7 10s. per cwt.

The root crops are turning out exceedingly good in quantity, and of very superior quality: indeed, both carrots and turnips for cattle and other uses are unusually abundant. The abundant supply of hay on most farms—the second cut having nearly equalled the first—is calculated to keep that article at a low figure for some time. We may safely assume, therefore, that the graziers will be in the position to supply the markets gradually; whilst we regret to find—considering the good prices at which fat beasts and sheep have been selling for several months past—that such immense numbers of almost store animals should have been forced for sale, as has been the case during the month just concluded. It must, we conceive, be evident that such a system, if persevered in, will lead to unfavourable results.

Throughout Ireland the potato disease is represented as having done considerable injury; but in Scotland it does not appear to have much increased, although numerous instances have presented themselves in which the tubers have been seriously affected. The shipments to the south have already commenced, and the samples yet received in London have been in full average condition. The markets have been well supplied with most kinds of grain, in which rather an extensive business has

been doing, and the quotations have had an upward tendency.

The wool trade has assumed a firmer tone. The public sales of colonial now in progress, being the last series for the present year, continue to be well attended, and the whole of the colonial samples offered have been disposed of at an advance of from ½d. to 1d. per lb. The few foreign wools brought forward have commanded scarcely any attention.

The value of raw hides, when the immense demand for leather on colonial account is taken into consideration, rules low; but sheep skins are commanding good prices.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the various cattle markets held during the month have been extensively supplied with each kind of stock, especially beasts, the general condition of the arrivals has been unusually inferior. The consequence is that a wide margin has been observed in the quotations—in other words, really fine beasts and sheep have sold at comparatively high rates, whilst other qualities have changed hands at low currencies. In Smithfield, at least two-thirds of the stock have been extremely poor; whilst much surprise has been expressed that the graziers, considering the great abundance of food, and the relatively profitable returns from the different fairs, should have forced off such large numbers of what otherwise might become good saleable animals. It is evident, however, that the backwardness of the spring of the present year had much influence upon the beasts; and, further, that most of the leading grazing districts are well stocked. The yield of rough fat has materially fallen off; consequently the Baltic merchants have successfully taken advantage of that circumstance, and increased the value of Russian produce to some extent. The price of the former article has, therefore, advanced to 2s. 5d. per 8lbs. Assuming that there is no deficiency of English stock, we are of opinion that the supply of beef for Christmas consumption will be unusually large, and of very prime quality, as we understand that stall-feeding is now being carried on to a greatly increased extent in Norfolk and elsewhere. From abroad the imports of stock have been on a very liberal scale. The Jutlanders have made great exertions in forwarding supplies, as their season is now rapidly drawing to a close. Correspondents in Holland state that the quantities of stock there are evidently on the increase, although the exports have greatly exceeded all former seasons. It is to be regretted that such masses of miserably fed beasts should be received here from that quarter as we have noticed of late. To our butchers they are of very little use, and this must be obvious when we observe that numbers of them have sold as low as £5 each. Some contemporary prints state that large supplies of Spanish sheep have continued on sale in Smithfield; whereas not a single importation has taken place during the whole of the present year.

The following are the arrivals from abroad into the metropolis:—

	Head.
Beasts	7,792
Sheep	26,672
Calves	1,350
Pigs	1,624

COMPARISON OF IMPORTS.

Oct.	Beasts.	Sheep.	Calves.	Pigs.
1851....	5,292	18,688	1,495	1,912
1850....	5,939	20,982	1,312	1,702
1849....	5,008	16,190	565	243
1848....	2,962	10,669	803	116
1847....	5,433	17,635	1,225	433

The total numbers of English and foreign stock shown in Smithfield are as under:

	Head.
Beasts	26,134
Cows	525
Sheep	132,430
Calves	2,556
Pigs	2,770

COMPARISON OF SUPPLIES.

	Oct. 1848.	Oct. 1849.	Oct. 1850.	Oct. 1851.
Beasts....	20,177	22,477	23,116	22,092
Cows	487	457	440	450
Sheep....	114,760	146,200	138,110	119,050
Calves ..	2,200	1,946	2,120	1,999
Pigs	3,140	2,085	3,615	3,470

The arrivals of beasts from Lincolnshire, Leicestershire, and Northamptonshire have amounted to 13,000 shorthorns; from other parts of England, 2,000 of various breeds; and from Scotland, 227 horned and polled Scots; the remainder of the supplies having been derived from abroad and the neighbourhood of the metropolis. The following is the general range in the quotations:

Per 8lbs. to sink the offals.

	s. d.	s. d.
Beef.....from	2 0 to	3 10
Mutton.....	3 0 to	4 6
Veal.....	2 6 to	4 0
Pork.....	2 10 to	3 10

COMPARISON OF PRICES.

	Oct., 1848.				Oct., 1849.			
	s.	d.	s.	d.	s.	d.	s.	d.
Beef.. from	2	4 to	4	0	2	4 to	3	10
Mutton	3	4 to	5	0	2	8 to	4	0
Veal.....	3	0 to	4	2	3	0 to	3	6
Pork	3	10 to	4	10	3	2 to	4	2

	Oct., 1850.	Oct., 1851.
	s. d. s. d.	s. d. s. d.
Beef .. from	2 4 to 3 10	2 6 to 3 8
Mutton	2 10 to 4 0	2 10 to 4 2
Veal.....	2 6 to 3 8	2 8 to 3 10
Pork	3 0 to 4 2	2 10 to 3 10

Very large supplies of country-killed meat, estimated at nearly 30,000 carcasses, have been received up to Newgate and Leadenhall. Those on offer slaughtered in London have been seasonably large. On the whole, an extensive business has been transacted, as follows:—Beef, from 1s. 10d. to 3s. 4d.; mutton, 2s. 6d. to 4s. 2d.; veal, 2s. 6d. to 3s. 10d.; pork, 2s. 6d. to 3s. 10d. per 8lbs. by the carcass.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ASHBORNE FAIR.—The horse fair was not so numerously supplied with colts, but anything useful was well sold, and for the best quality great prices were realized. The cattle fair was not so largely supplied with either store or fat cattle as usual; and there being plenty of customers, most would be sold at good prices. The sheep pens were well filled with sheep, but not quite so well sold as was expected; yet good store sheep, as well as nice small fat ones, fetched good prices. Lambs seemed flatter sale. There was a middling show of rams, but, with the exception of a few of the best, prices were very unsatisfactory, especially considering the price of store sheep. Beef made 4½d. to 5d., sheep from 5d. to nearly 6d. per lb.

AUCHTERARDER FAIR.—The stock brought forward was very superior, and in good condition. Fat ranged from 6s. to 7s. per Dutch stone, and was soon all bought up Stots and queys were also in good demand, at prices equal to the late advance.

AXBRIDGE FAIR.—There was a numerous attendance, and a very large supply of stock; indeed, altogether beyond the most sanguine expectations of the promoters. Pens were provided for 600 sheep, which it was thought would be adequate to the arrivals, but accommodation had to be made for from 1100 to 1200 of the fleecy tribe. There was a good supply of fine beeves, chiefly of the Somersetshire grazing, which fetched in many instances from 9s. to 9s. 6d. per score. Mutton 5½d. to 6d. per lb.

AXMINSTER FAIR was very numerously attended with farmers and dealers. The supply of sheep and cattle far exceeded the number offered at many of the previous fairs, and the sale was quick at good and satisfactory prices.

BEDALE FORTNIGHT FAIR.—We had a large supply of cattle and sheep, both fat and for holding. All were pretty well sold up, though slowly, and at a slightly reduced price. Beef, 5s. 3d. to 6s. per st.; mutton, 5d. to 6d. per lb.

BLACKBURN FAIR.—The show of cattle was a remarkably good one, and fair prices were realized for most descriptions of stock. Heifers and calvers were in good demand, and were sold at advanced prices. The show of horses was but indifferent. Of pigs a great number were offered for sale, and remunerative prices were obtained for choice animals. On the whole, a large amount of money must have been turned over on the Moor.

BRENTWOOD FAIR was one of the best that has been held for some time, both as to the number of beasts shown and the extent of business transacted. Of beasts, particularly Herefords, the supply was very large, and great numbers were taken off at an advance of £2 per head on last year's prices, some of the droves realizing £18 to £20 per head. Sheep maintained the prices of late fairs. Of horses the numbers shown were not large, but there were some very good ones on the ground, which commanded high prices.

CHICHESTER ANNUAL SLOE FAIR.—On Wednesday, 20th inst., being a very fine favourable day for this fair, the holiday folks from town and country, came in groups to the pleasant spot, the fair being held in a meadow near the city, the property of J. B. Freeland Esq. It is both a pleasure fair, and in some respects for business, the chief returns being the annual show for the sale of young cart horses for farmers, and Sussex new hops, the price of which, this season, is 10d. per lb. in small bags to suit the cottagers, &c.

CAISTOR FAIR.—The sheep and horse fair exhibited an average show both in quality and quantity, and the demand for sheep ruled steady at the late high prices. Lambs sold at 26s. to 32s. per head; sheep at 5½d. to 6d. per lb. Of beasts we had a plentiful supply, and the demand was active and extensive. Fat beasts realized 5s. 6d. to 6s. per st.

COLCHESTER FAIR. — A good deal of business was transacted, especially in beasts, of which there was a larger show than was ever before recollected, and a good proportion changed hands in the course of the day. The prices were: for good polled Scots, from 7*l.* 10s. to 11*l.* 10s.; shorthorns, from 6*l.* to 12*l.* 10s.; Welsh beasts, of which there was a large supply, were not in such brisk demand as other kinds; those sold fetching the following prices: small, 3*l.* to 6*l.*; good ditto, from 8*l.* to 10*l.*; and a few nearly fit for the butcher were sold at from 11*l.* to 12*l.* Of sheep there was also a very large number penned, and although the trade was rather slow at the commencement, a good number were disposed of, lambs fetching from 20s. to 35s., and ewes from 28s. to 36s.; wethers, a small show, from 30s. to 36s. The horse trade on the whole was remarkably slow; a few good English colts sold from 28*l.* to 33*l.* About 20 or 30 Flemish colts were shown, but could not be got rid of at any price, and up to a late period of the day remained unsold. Cart horses realized from 25*l.* to 35*l.* The nag trade was unusually dull.

DEVIZES FAIR.—There was very little difference in the prices obtained for sheep from those of Weyhill; but the trade was heavy, and in some instances a reduction of 6d. a head was submitted to towards the close of the fair, and several lots were taken home unsold. The supply was good of every description. Best ewes realized from 30s. to 36s.; lambs, from 25s. to 30s.; wethers, from 30s. to 40s.; and inferior sorts less prices. The show of cattle of every description was short, but quite equal to the demand. The horse fair comprised chiefly young rough horses from Ireland and Wales, which met a fair sale; and there were a few cart colts, among which we may mention, as an object of attraction, a beautiful two-year-old grey mare, belonging to Mr. Hillier Reeves. Such an animal, we are told, has not been exhibited in Devizes for many years. It was purchased by Mr. Fowle, of Lavington. There was scarcely a good nag to be seen.

EARLSTOUN FAIR.—There was the usual show of cattle—about 1,000 head—chiefly for laying on to turnips, and for the straw-yard. The sellers stood out for the recent rise in prices, which buyers were unwilling to submit to, and consequently sales were slow. A few remained unsold. Prices for stirks from £5 10s. to £7 17s. 6d; two-year-olds, from £8 to £11; fat, from 5s. 6d. to 6s. per stone. In the horse market there was an indifferent show, and the demand was dull, except for young horses rising three years old, some of which brought from £40 to £50 a pair.

HEREFORDSHIRE FAIR was a good one; very little, if any, stock being driven off unsold. It is emphatically a fair for steers, and fully the usual number were brought to town. The price, of course, varied according to the quality; some being disposed of so low as £10, whilst others (prime ones) realized £25 and upwards; the average of good two-year-old steers may be quoted at from £16 to £18 each, being about 12½ per cent., or 50s. in £20 more than was obtained this time last year. Of fat cows there were but few on sale, and 5½d. to 5½d. per lb. was about the price at which they sold. Sheep were not numerously offered, nor was the demand brisk. Wethers, 6d.; ewes, 5½d. Pigs were in request, and there was a tolerable supply; porkers fetched 4d. to 4½d. per lb.; small stores, from 18s. to 25s. The horse fair contained some good animals, but the trade was principally confined to those for drought or agricultural purposes. As usual, there were

but few good nag horses on sale. Less hops were pitched (at the time we write) than for many years past; £5 per cwt. was asked, but 10d. per lb. was about the price obtained for good samples. The price of cheese varied at from 30s. to 34s. per cwt. for skim; seconds, 36s. to 42s.; best make, 48s. to 52s.

ILSLEY FAIR was pretty well supplied with sheep. The attendance of dealers was small: the consequence was, trade was quiet, and resulted in a reduction of something above 1s. a head from our last. Most of the sheep were sold at the reduction named, and the trade must still be considered good.

KENDAL FORTNIGHTLY FAIR.—There was but a thin show of cattle; and, with the exception of a few horned Scots, none in very good condition. Cows were offering at from £10 to £12, of the best class; aged and inferior ones at from £8 to £9; heifers at from £9 to £11; calves at from £1 10s. to £2 12s. Sheep were numerous, and were selling at, for South Downs, from £2 2s. to £2 5s.; cross breeds from £1 8s. 6d. to £1 13s.; blackfaced ones from 23s. 6d. to 25s.; lambs from 18s. to 21s. Lean stock milch cows, of which there was a considerable number at market, were offering at from £9 to £12 10s.; blackfaced sheep were selling at from 19s. to 21s.; lambs of all breeds from 17s. to 19s., according to condition and breed. Dealers were pretty numerous, but owing to the demands of sellers, sales were with difficulty effected, yet before the close of the market a good clearance was accomplished. Average price per lb.:—Beef, 4¾d.; mutton, 5¾d.; lamb, 5½d.

LINCOLN STOCK MARKET, (Wednesday last)—There was a plentiful supply of Beasts, though only of a middling quality, and the prices realized were from 5s. 6d. to 6s. per stone. As has usually been the case latterly, sheep were very scarce and dear, and mutton fetched fully 6d. per lb. In one instance, a pen of sheep were sold by weight at 6½d. per lb, the seller agreeing to return 1s. upon each sheep to the purchaser.

LITTLE DUNNING (PERTHSHIRE) MARKET.—In the butter and cheese markets there were about 200 carts, which were entirely cleared out by two o'clock, at prices in advance of those of late markets; many carts of butter, bringing 18s. per stone of 22lbs., though the average may be quoted at 17s. 6d.; cheese, same weight, from 4s. 6d. to 5s. 3d. In the cattle market there was a numerous appearance, but of superior beasts the number was limited, and these were readily bought up. Best beef may be quoted at 7s. and 7s. 3d. per stone of 17½lbs., sinking the offal; inferior, 6s. 6d. Two-year-old beasts, for wintering, from £5 to £7 a head; and three-year-old queys, £8—a little more or less according to quality; milchers, £8 to £11. Sheep from £1 5s. to £1 15s. Pigs were selling in the town at from 8s. to 10s. 6d.

MAIDSTONE FAIR was the largest that has been held here for very many years, and the weather being fine the attendance was much greater than usual. There was an excellent show of cattle, horses, and sheep, and a good deal of business was done, prices being fully maintained. The horses realize very long prices, as much as 40 and 45 guineas being demanded for horses and colts. There was a good supply of hops, the best Mid and East Kents selling well, other inferior samples went off slowly; fine Weald of Kent and Sussex hops were readily sold, and fetched good prices.

MELROSE EWE FAIR.—There was a large supply of ewes, particularly Cheviots, the current rise on which was from 2s. 6d. to 3s. 3d., while the prices of lambs ran very similar to that obtained at recent markets. The following were among the lots which exchanged hands, viz.:—The crack lots of Altrive and Findland sold at 22s. 6d.; those from Buccleuch were sold at 22s.; from Catslawburn were sold at 20s. 6d.; from Ladhope were sold at 20s. Several other lots were disposed of at 19s., and a large quantity left the market unsold.

NORWICH FAIR.—The show of Scots was small, but the condition and quality superior to late years; the numbers were from 1,100 to 1,200. Buyers were numerous, and an immense amount of business transacted. The primest Scots made 5s. per stone, but from 4s. to 4s. 6d. was the general figure. Of shorthorns the numbers were both large and good; prices varied from 3s. 6d. to 4s. 6d. per stone of 14lbs. when fat. At the close few beasts remained unsold. It may be observed, although there were great doubts of the breeders and dealers in the north being remunerated, still nothing can warrant the graziers giving better prices, admitting the turnip crop to be good, so long as wheat remains so ruinously low. In the horse fair there was scarcely a good animal to be seen.

STRANRAER MARKET was numerously attended by farmers and others, and also by dealers from the lower district of the county. Trade began exceedingly brisk, and was carried on with the same spirit during the market hours. A few lots were sold ere they reached the field, one of these being stirks from Kirkcolm, and bought at £6 each by a farmer in the same parish; another lot of stirks from the parish of Inch was sold in the park at £6 2s. 6d. a-head. These two lots were splendid animals of the age, and reflected much credit on the enterprising agriculturists that reared them. The number of cattle shown was about 300 head, comprising stirks, two and three-year-olds of the Galloway breed, with some Ayrshires and a few Irish; there was a very large bullock shown in the field, which sold at £12. Stirks were selling at from £3 7s. 6d. up to £4 10s.; a lot of very superior two-year-olds from Pinwherry were sold at £7 10s. each—this lot was allowed to be the best in the market: prices for two-year-olds were ranging from £7 and £6 17s. 6d, down to 5 guineas. The demand for Ayrshires seemed to be rather lagging, and a few lots of this kind of stock would be driven out unsold. The market was a good one, and the supply not equal to the demand.

WINCHESTER SHEEP FAIR. — There was a larger supply of stock penned than has been known for many years, about 40,000 sheep, 7,000 above an average The attendance of dealers was moderate, and consequently trade throughout the day was languid, and sales could only be effected at a slight reduction on the prices of Weyhill. Notwithstanding these reduced terms were submitted to, at noon several pens had not changed hands. The condition of the stock, generally speaking, was good, especially the lambs. Mr. Jacob Courtney, of Crawley, had some very fine lambs, which realised 35s. a head. Mr. Henry Pain, of Wallop, penned 200 lambs, which averaged 33s. a head; and Mr. James Fitt, of Westley, sold his fine stock of lambs at 34s. Wethers sold at from 45s. to 38s.; ewes, 33s. to 30s. The supply of sheep at Alresford market on Thursday was very limited, in consequence of its being near Winchester sheep fair. There were few dealers, and stock met a dull sale.

WOOLER FAIR.—There was a very large supply of all kinds of sheep; we have not seen such a large show of Cheviot wedders for above thirty years. The demand was very dull, at prices averaging from 2s. to 3s. below the prices given at St. Ninian's fair, and a good many lots went off the ground unsold. We quote the following prices:—Leicester dinmonts, 34s. to 42s.; do. gimmers, 28s. to 32s.; do. ewes, 33s. to 38s.; half-bred dinmonts, 28s. to 34s.; do. gimmers, 25s. to 28s.; do. ewes, 28s. to 33s.; Cheviot dinmonts, 22s. to 32s.; do. wedders, 24s. to 30s.; do. ewes, 21s. to 25s. There was a very large and fine show of cattle of all descriptions. Two- and a-half year-old steers sold at £11 to £14; one-and-a-half-year-olds, £6 to £8 10s.; and a lot of calves, nine months old, brought £3 12s. per head. The principal part of the animals in the horse market were of an inferior description, amongst which few sales were effected. There was below an average supply of pigs.

YORK FORTNIGHT FAIR.—We had a large supply of middling fed beasts, which had slow sale, many remaining on hand; the primest qualities sold at nearly 5s. 6d., inferior 4s. 9d. to 5s. per stone. Mutton sheep: hogs and gimmers, light weights nearly 6d, ewes and heavy weights 5d. per lb. Calving and dairy cows were in good demand, and prices steady upon former markets. Lean beasts for grazing were in good supply, and had fair sale, but at prices much lower than previous markets. Short-horned steers, heifers, and Scots had the call of the market. Irish cattle were in abundance, and many sold, but at very reduced prices. Lean stock of all kinds had a general downward tendency. The annual autumnal ewe and lamb fair had a much less supply than last fortnight, some estimating them at one-half, others at one fourth; but, in the absence of any market bye-laws for the proper entry of the number of sheep for sale, all this is mere conjecture: we think one-half would be nearest. We had a great falling-off in the number of buyers, which caused prices to fall from last market 2s., 3s., and 4s. per head, the decline varying according to the different kinds of stock shown. Many lots were left unsold.

REVIEW OF THE CORN TRADE

DURING THE MONTH OF OCTOBER.

The weather was favourable in the early part of the month for outdoor labours; and farmers were for some weeks busily engaged in the fields. The sowing of wheat, consequently, made considerable progress, and the seed in general was committed to the soil under favourable auspices. Within the last week, the work has been interrupted by heavy falls of rain; and it will require an interval of dry weather to restore the land to good order. Autumn-sowing is not, we think, so far advanced as usual at the corresponding season of the year; but the arrears might be soon brought up, if November should prove tolerably propitious. Whether as great a breadth of land will be cultivated with wheat as heretofore, may be doubted. That crop has for several seasons been the least remunerative to the British farmer; and it is, therefore, probable that others will, to a certain extent, be substituted: but, as yet, this has not been so generally the case as to call for particular remark.

As regards the result of the last harvest, we see no reason to alter materially the estimate we ventured to submit to our readers in September. That the extent of the injury sustained has not been overrated, we feel perfectly satisfied—indeed, we doubt whether farmers, in the districts which escaped best, will be reimbursed by their crops for their outlays; and that many will be very severe losers is certain. Even in the north of England, where the weather during harvest-time was comparatively propitious, a considerable proportion of the produce proves of ordinary quality; and in all the southern counties, the complaints are nearly universal. One of the surest tests of quality is weight to the bushel; and, tried by this, the wheat crop must be considered as lamentably deficient in all the best wheat-growing districts of England. 60 to 61lbs. per bushel may be considered as the exception, the greater part being 58 to 60lbs., and a very large portion only 56lbs. per bushel. On the average, the weight may be fairly considered 4 to 5lbs. less than last year.

The sales hitherto made have been at very unremunerative rates. In many cases, farmers have not netted more than 25s. to 30s. for the worse portion; and the best dry qualities have scarcely returned over 35s. to 38s. per qr. If, therefore, there had been a considerable excess in quantity, instead of a bare average (at which the yield per acre is generally estimated), the return would not pay for the outlay; and it may consequently be regarded as a positive fact that most of the English farmers will this year have to pay rent out of capital. Their only hope is that, after the wheat shall have been subjected to an interval of dry, frosty weather, it may improve in quality, and its value be thereby raised. Hence, those who are in a position to hold will be inclined to wait, more especially as the position of affairs warrants the expectation that prices may advance during the approaching winter. Indeed, surprise is felt by those best acquainted with the trade that, whilst all other branches of commerce have enjoyed a considerable amount of activity, the corn-market should have remained dull. Such has, nevertheless, been the case, and prices have scarcely varied since we last addressed our readers. That this state of things is attributable to the same cause which has operated so disadvantageously for the interest of British agriculture the past six years, does not admit of question. The facility with which our markets may be inundated with foreign corn, at any period when foreign merchants consider prices high enough to induce them to consign, renders the course of prices here dependent more on the harvest abroad than at home. It may pay the continental grower well to sell at rates which would not remunerate our producers. This year, for example, Great Britain has unfortunately to deplore the occurrence of an unfavourable harvest, whilst abroad the crops have given a good yield. If, therefore, rents, labour, and other expenses were the same on the continent as in this country, our neighbours could still afford to undersell the home producer; and with the decided advantage which they have in each and all these points, the competition is unfair and ruinous to one of the most important interests of Great Britain. There is, however, a probability that foreign speculators, being perfectly aware that England must have wheat of good quality to mix with her inferior new, will hold back supplies; and we are therefore inclined to think that the importations will be so regulated as not to overwhelm our markets. At all events, the shipments from the north of Europe between this and the setting in of winter cannot be very great, old stocks of wheat being reduced into a narrow compass at most of the Baltic ports, and the deliveries of new from the growers having hardly

commenced. Under these circumstances, we are disposed to look for a moderate improvement in the value of breadstuffs, and think prices will not be lower than they now are, for the next six months.

Though spring corn and pulse have commanded relatively higher rates than wheat since harvest, the supplies of the former have thus far been quite moderate; this can only be accounted for by the supposition that the stocks of old having been completely exhausted, farmers have been compelled to use considerable quantities of new for fodder for cattle, pig feeding, &c.

As regards quantity the barley crop has, we believe, given a good yield; but the proportion of fine samples suitable for malting will be exceedingly small. So little of the latter has hitherto come forward, that prices of fine malting barley have crept up in all parts of the kingdom, notwithstanding great caution on the part of buyers.

Oats appear to have suffered more extensively from the wet weather at harvest time than was at first supposed, and most of the new which have been brought forward at the different provincial markets have been of light weight and in soft condition. The Scotch and Irish farmers appear to have been more fortunate with this crop; but in those counties in England where oats are most extensively grown, the proportion of fine corn will, we fear, be very small.

The shortness of the bean and pea crops is now universally admitted, and there is reason to believe that feeding articles will maintain the relatively high value, as compared with that of wheat, which they have borne since harvest; and should prices of the latter rise (as is not improbable) all other kinds of corn and pulse would, we think, advance in the same proportion. This opinion is strengthened by the acknowledged deficiency in the produce of potatoes; the last named article has already become too dear to be used for feeding, and even as human food it is relatively dearer than bread. That this must tell later in the year cannot be questioned, and on the whole we are inclined to think that the reasons we have adduced are sufficient to warrant the opinion which we have ventured to give, viz, that a moderate advance in the value of agricultural produce is not improbable.

So much for speculations on the probable future; we shall now proceed to take our usual retrospect of the transactions at Mark Lane during the month. Whilst most other important branches of business have been stimulated to increased activity by the abundance of capital resulting from the continued influx of gold into this country from Australia and California, the corn trade has remained in a very passive state. Speculators have given a preference to all other kinds of investments, and Mark Lane has been left to its usual and legitimate operators. Even our own millers and merchants have acted with great caution, and the activity which a superabundance of money has given rise to in other commercial transactions has been little felt in the grain trade. This certainly has its advantages; if there have been no great profits, neither is there the chance of serious losses; and though there has not been much animation, a steady consumptive demand for most articles has prevented prices giving way.

The arrivals of wheat coastwise into the port of London the first fortnight in October were tolerably good, but the receipts did not exceed what was needed to provide for the consumptive demand of the metropolis. On Monday, the 4th inst., the finest qualities of new English wheat realized 1s. per qr. more than on that day se'nnight, and other sorts maintained their previous value. During the succeeding fortnight prices remained perfectly stationary at Mark Lane, though the tendency was upwards in most of the agricultural districts. Towards the close of the month the supplies fell off, and on the 25th there was scarcely sufficient exhibited on the Essex, Kent, and Suffolk stands to meet the demand. An attempt was consequently made to establish an advance, which was, however, steadily resisted by purchasers; and we consider prices about the same at the close as they were in the beginning of the month. Inferior kinds of red wheat might still be bought at 35s. per qr., and the best dry runs of red Kent and Essex are not worth more than 40s. to 42s. per qr. The offers from Lincolnshire and Cambridgeshire have not increased materially, nor have prices for these sorts varied; but during the last eight or ten days there has been somewhat more disposition to buy.

The arrivals of wheat at this port from abroad have been rather liberal, nearly 100,000 qrs. having come to hand during the month. Of this quantity rather more than one-third has been from the Mediterranean and Black Sea ports, a small portion from America, and the remainder from the Baltic and near continental ports. The largest arrival was during the week ending the 16th inst., when 48,000 qrs. were received, principally from the north of Europe; and a large proportion of this went direct to London millers, who had sent orders to Danzig, Rostock, &c., in the month of August. The supply, on the whole, has exceeded what has been required for immediate use, and the stocks in warehouse have rather accumulated. In some few cases importers have preferred to give way slightly in prices to incurring landing expenses, but this has not generally been the case, and quotations have undergone but little alteration since our last. The finer kinds of old Baltic red wheat have not

been sold below 46s. to 48s., and choice Rostock has realized 50s. per qr. in retail. Mixed Danzig and Konigsberg has been taken for immediate use in small quantities at 45s. to 47s., and superior high mixed at 48s., 50s., and even 52s. to 53s. per quarter. The Black Sea wheat has been obtainable at lower rates, Polish Odessa having been freely offered at 38s. to 40s. per qr., and other descriptions at corresponding terms. In addition to the business done in wheat on the spot, rather large transactions have taken place in floating cargoes, and the sellers of Polish Odessa and other similar sorts have succeeded in realizing relatively more money for cargoes on passage than has been obtainable for wheat of the same character in granary. The offers from the Baltic have generally been at too high rates to allow of much business being done; the sales effected have been principally of fine Danzig, for which high prices have been given free on board; indeed, so high have the terms insisted on by the foreign merchants been, that, unless our prices undergo a rise, the parties who have been bold enough to make purchases may run the risk of losing by their investments. Good Lower Baltic red wheat has been offered at 43s. to 44s. per qr., cost, freight, and insurance, without leading to sales of any importance.

The nominal top price for town manufactured flour has remained stationary throughout the month. During the first fortnight most of the town bakers were free buyers, and large forward sales were made; the trade may therefore be considered to be now well in stock, and this has been felt the last eight or ten days, the sales having been much less extensive than before. The arrivals of country made flour into London have been on a moderate scale, and the stocks on the wharves are not by any means heavy; prices have ranged from 28s. to 34s. per sack, according to quality, mark, &c. Good Norfolk household has been selling, and is still worth, about 30s. per sack. The receipts of foreign flour have been smaller than expected, more especially from America, and quotations have therefore been well supported. Fair brands of American have not been sold under 22s., and superfine to extra superfine have brought 23s. to 25s. per bri. Of French flour very little has come to hand, and according to the accounts from thence there seems to be no prospect of supplies of magnitude—a fortunate thing for our millers.

The arrivals of English barley have been considerably less than the quantity usually received at the corresponding period of the year, and of that which has come forward only a small proportion has consisted of fine malting quality. This grain has been in good demand throughout the month, and the tendency of prices has been upwards, more particularly for the finer sorts. Choice malting parcels, such as were worth 33s. to 34s. per qr. at the close of September, cannot at present be secured below 34s. to 35s., and the latter rate was, we believe, realized in several instances on Monday last. In many of the country markets prices are still higher, as much as 38s. per qr. having been paid. Distillers' barley has not sold so freely as other sorts in the London market, but there has been no giving way on the part of factors; it is, however, probable that supplies of the latter may increase, and that sellers may then have to make some concession. We have had a very extensive demand for feeding barley, and though the arrivals from abroad have been tolerably good, nearly the whole which has come forward has been cleared off the market at gradually improving rates. The only kind of which there is any quantity remaining is Egyptian, and of this the stock has been considerably reduced. Common Danish and similar sorts, weighing 50lbs., have sold at 25s., and heavier descriptions at 26s. to 27s., some as high as 28s. per qr. Turkish barley, which was obtainable at the close of last month at 19s. to 20s., is at present worth 21s. to 22s. per qr., though not generally liked for grinding purposes.

The upward movement in barley prices has naturally influenced the value of malt: the sale for this article has been lively, and with good supplies prices have risen 1s. to 2s. per qr.

Stocks of old oats, of home growth, have long since been exhausted, and it has become a rarity to see a sample. The receipts of new coastwise have thus far been very small, and the quantity received per rail quite moderate. The few lots which have come forward from Lincolnshire and that neighbourhood have proved of very inferior quality, and have consequently been difficult to place: 36 to 37lbs. feed at 17s. 6d. to 18s. 6d., and 40lbs. qualities have brought 1s. to 2s. per qr. above the last-named rate. The new Irish oats are decidedly superior to those of English growth, and have consequently met with more demand, the lighter kinds at 18s. to 19s., and fine heavy samples at 21s. per qr. The principal business has, however, been in foreign oats, few horse-keepers being disposed to feed on new whilst old are obtainable. The arrivals from abroad, without being large, have been on a sufficiently liberal scale to prevent prices rising materially; still some improvement has taken place, good Archangel being now currently worth 18s. 6d. to 19s., St. Petersburg and Riga 19s. to 20s., Danish and Swedish 20s. to 21s., and Dutch Polands 21s. to 22s. per qr. The quantity of old oats in warehouse is drawing into a narrow compass. The Russian supply is believed to be all to hand, and the quantity on passage from

other continental ports is considered to be moderate. Under these circumstances, holders calculate on present rates being at least supported for old oats, and many are sanguine of a further improvement.

The rise which took place in the value of beans during last month has not had the effect of drawing larger supplies, the receipts of this article having been very small since our last. Buyers have been cautious in their operations; notwithstanding which, the tendency has continued upwards. At present good hard *new* tick beans cannot be bought below 32s. to 33s., and harrows are worth 34s. to 35s., pigeons up to 40s. per qr., if small and handsome. Foreign old beans range in value, for Baltic sorts from 30s. to 37s., and Egyptian have risen to 30s. per qr.

The arrivals of peas of home growth into London coastwise, as well as by rail, have been perfectly insignificant, and the receipts from abroad have been quite trifling. The splitters have experienced considerable difficulty in buying a sufficient quantity of white peas to keep their regular customers supplied, and have had to pay very high rates for fine breakers. The top price, at the end of September, did not, we think, exceed 40s. per qr.; subsequently 42s., then 44s., and latterly 46s., and in one instance, we believe, even 48s. per qr. has been realized. Foreign peas have not risen quite so rapidly, and it has been difficult to exceed 40s. per qr. for the latter. Grey and maple have remained nearly stationary in value.

A very large business has been done during the month in floating cargoes of Indian corn, principally by buyers on Irish account, where the consumption has been very great, and is daily increasing, owing to the scarcity of potatoes. The arrivals off the coast have been considerable, but nearly all the cargoes which have come forward have been ordered to proceed to the sister isle, for which the demand still continues. The rise since we last addressed our readers may be fairly estimated at 1s. to 2s. per qr.; Galatz, which was then selling at 30s., having lately found ready buyers at 31s. to 32s. per qr., cost, freight, and insurance; and other kinds at corresponding rates. Large supplies of this article are still expected from the Black Sea, but holders appear confident, and manifest no anxiety to realize; indeed more money is in general asked for distant cargoes than for such as are close at hand—a tolerably strong proof that no reaction is anticipated. At Liverpool prices are about the same for floating cargoes as in London.

Whilst prices of Wheat have remained nearly stationary in our markets, the tendency abroad has been decidedly upwards. This has not been caused by any very extensive export demand, but by a disposition on the part of foreign merchants to speculate, under the firm conviction that Great Britain will sooner or later require supplies.

At Danzig the transactions have been extensive during the last few weeks, and for the finer kinds of old high prices have been realized. Stocks have been greatly reduced there by the September shipments, and as no material supplies of new were calculated on, the prevailing opinion was that the value of the article would rise during the winter. The quality of the new Upper and Lower Polish wheat is described as fine, and the weight good. Spring corn, on the other hand, has yielded indifferently in all those districts from which Danzig is supplied, and scarcely sufficient had come forward to provide for the local consumption.

Konigsberg letters give a similar account of the result of the harvest, the wheat being fine in quality, and having given a good yield to the acre; but all other articles short. Some speculative purchases of wheat had been made there, which had caused the price for fine high-mixed old to rise to 42s. 6d., and for choice parcels of new equal to 44s. per qr., free on board had been paid. Beans and peas (of which this port usually furnishes some quantity) were very scarce; the former were quoted 30s., and the latter 31s. per qr., free on board.

The advices from the Lower Baltic ports do not call for any particular comment. Stocks of old wheat are decidedly short in that quarter, and those of other articles nearly exhausted; and farmers having been too busily employed in the fields to allow of supplies of new corn to any extent being brought forward—transactions on a large scale have been out of the question. The wheat crop has certainly given an excellent return both in quantity and quality in all the countries bordering on the Baltic, and we may consequently reckon on considerable supplies from thence; these, however, cannot be looked for before the spring of next year, unless we should have an unusually mild open winter.

The value of good wheat in Stettin, Rostock, Stralsund, Wismar, &c., at present is 38s. to 40s. per qr., free on board, but rather more money is asked for spring shipment.

At the near continental ports prices have been regulated more or less by the advices from hence; in the beginning of the month wheat had a tendency to rise at Hamburg, Rotterdam, Antwerp, and in the principal French markets; but the subsequently received English accounts being regarded as discouraging, a slight reaction afterwards took place; quotations continue, however, too high at most of

the places named to allow of any margin for profit on shipments to England.

The most recent advices from the Mediterranean quote wheat relatively higher than with us, and there is consequently little prospect of advantageous business being done with that quarter.

At the principal Black Sea ports large purchases of wheat and Indian corn were made in September and the early part of October, for shipment to Great Britain, and we may calculate on considerable supplies from thence. The prices paid there have been so high as to render it doubtful whether the Greek houses here (who have been the principal operators) will gain much by their speculations.

The accounts from America, by the steamer Canada, state that supplies of wheat and flour from the interior had increased, and the export demand having at the same time slackened, prices had rather receded at the principal shipping ports on the coast.

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's *Gazette*.	Qrs.	s.	d.	Averages from the corresponding *Gazette* in 1851.	Qrs.	s.	d.
Wheat....	117,026 ..	38	8	Wheat....	106,335 ..	36	9
Barley....	63,145 ..	28	8	Barley....	59,447 ..	25	5
Oats	20,475 ..	17	10	Oats	20,658 ..	17	5
Rye.....	368 ..	25	8	Rye.....	329 ..	23	8
Beans....	4,437 ..	34	2	Beans	4,901 ..	28	6
Peas	3,767 ..	30	9	Peas	2,267 ..	27	7

AN ACCOUNT SHEWING THE QUANTITIES OF CORN, GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM IN THE MONTH ENDED 10TH OCTOBER, 1852, THE QUANTITIES UPON WHICH DUTIES HAVE BEEN PAID FOR HOME CONSUMPTION DURING THE SAME MONTH, AND THE QUANTITIES REMAINING IN WAREHOUSE AT THE CLOSE THEREOF.

Species of Grain.	Quantity imported.	Quantity entered for consumption.	Quantity remaining in warehouse.
Wheat, from British Possessions	qrs. bush. 1950 0	qrs. bush. 1950 0	qrs. bush. 1 2
Barley, do.	1 0	1 0	—
Oats, do.	—	—	—
Peas, do.	522 3	522 3	—
Maize or Indian Corn, do.	—	—	—
Wheat, foreign	313553 5	313703 5	2458 3
Barley, do.	30483 6	30483 6	15 5
Oats, do.	179752 2	179752 2	24 0
Rye	1558 0	1558 0	—
Peas, do.	3244 3	3244 3	—
Beans, do.	17377 0	18727 1	447 4
Maize or Indian Corn, do	192363 2	192863 2	—
Buckwheat	647 3	647 3	—
Malt	—	—	—
Beer or Bigg	—	—	—
	cwts. qrs. lbs.	cwts. qrs. lbs.	cwts. qrs. lbs.
Flour from British Possessions	12198 1 22	12198 1 22	6 3 18
Flour, foreign	286209 0 11	286209 0 11	7 2 26

HOP MARKET.

BOROUGH, MONDAY, October 25.

The market is very firm for fine Hops, at a trifling improvement in value; but inferior sorts are heavy, at barely late quotations.

Mid. and East Kent pockets ..... 88*s.* *to* 145*s.*
Weald of Kent ditto ..... 70*s.* „ 84*s.*
Sussex ditto ..... 70*s.* „ 84*s.*

POTATO MARKET.

SOUTHWARK, WATERSIDE, OCTOBER 25.

In commencing our report for the season, we are happy to observe Potatoes are coming in much better condition, and less diseased than was expected. During the past week the supplies, foreign, coastwise, and by rail, have been considerable and prices declining.

York Regent's ..... 100*s.* *to* 120*s.*
Lincolnshire ditto ..... 90*s.* „ 110*s.*
Shaws ..... 80*s.* „ 90*s.*
Scotch Regents ..... 80*s.* „ 100*s.*
French..... 80*s.* „ 90*s,*

WOOL MARKETS.

LIVERPOOL, October 23.

SCOTCH.—There is only a fair inquiry for Laid Highland wool at former rates; white Highland is scarce, and much wanted. Cheviots and Crosses are in good demand, and the stocks are rather low for the season.

		s.	d.		s.	d.
Laid Highland Wool, per 24lbs.....		9	6	*to* 10	3	
White Highland do.		13	0	14	0	
Laid Crossed	*do..unwashed*	11	6	12	6	
Do.	*do..washed*	12	6	13	0	
Laid Cheviot	*do..unwashed*	12	6	14	0	
Do.	*do..washed*	14	0	17	6	
White Cheviot	*do.. do.*	24	0	28	0	

FOREIGN.—The trade are much engaged with the sales now in progress in London; sales are also to take place here on the 2nd. There is not much going on by private.

FOREIGN WOOL.

LEEDS, Oct. 22.—Sales in both foreign and colonial wools have only been effected to a limited extent during the past week. The improved rates hitherto obtained at the present series of sales in London have tended to give increased firmness to prices here.

HIDE AND SKIN MARKETS.

		s.	d.		s.	d.	
Market Hides, 56 to 64 lbs.....		0	1¾	*to* 0	2	*per lb.*	
Do.	64 72 *lbs*.....	0	2	0	2½	„	
Do.	72 80 *lbs*.....	0	2½	0	3	„	
Do.	80 88 *lbs*.....	0	3	0	3½	„	
Do.	88 96 *lbs*.....	0	3½	0	3¾	„	
Do.	96 104 *lbs*.....	0	3½	0	4	„	
Lamb Skins.....		2	6	4	0	*each.*	
Horse Hides.....		5	0	0	0	„	
Calf Skins, light		1	0	2	0	„	
Do. full		0	0	4	6	„	
Polled Sheep		4	6	5	2	„	
Half-breds		3	6	4	2	„	
Downs.....		2	7	4	0	„	

MANURES.

LONDON, OCTOBER 25.

LINSEED CAKES are firm at a further improvement, and scarcely any offering on the market.

RAPE CAKES very scarce, and no foreign to be had.

PRICES CURRENT OF GUANO.

Guano Peruvian.....*per ton*	£0	0	0	*to* £9	5	0
„ *In quantities under 5 tons* „	0	0	0	9	10	0
Bolivian Guano ..... „	7	5	0	0	0	0

ARTIFICIAL MANURES, OIL CAKES, &c.

Peat Charcoal	„	2	15	0	0	0 0
Nitrate Soda	„	15	0	0	0	0 0
Nitrate Potash or Saltpetre	„	26	0	0	28	0 0
Superphosphate of Lime	„	0	0	0	6	0 0
Soda, Ash or Alkali.....	„	0	0	0	8	0 0
Gypsum	„	1	5	0	1	10 0
Coprolite	„	2	5	0	3	0 0
Sulphate of Copper, or Roman Vitriol for Wheat steeping....	„	27	0	0	29	0 0
Salt	„	1	1	0	1	5 0
Bones ½ inch ..... *per qr.*	0	0	0	0	15	0
„ *Dust*..... „	0	0	0	0	17	0
Oil Vitriol, concentrated ..... *per lb.*	0	0	0	0	0	1
„ *Brown*..... „	0	0	0	0	0	0¾
Rape Cakes..... *per ton*	5	0	0	5	10	0
Linseed Cakes—						
Thin American in brls. or bags „	9	0	0	9	10	0
Thick ditto round..... „	7	15	0	8	0	0
Marseilles ..... „	0	0	0	0	0	0
English..... „	8	5	0	8	15	0

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A Hereford Cow

The Property of Mr. Hugh [illegible] of Gloucester was Commended Second in Class 1st at the Show of
and the 2d Class 2d was awarded at the Midland Counties Cattle Show [illegible]

Daniel C. Bourke

The Property of P. Buren

THE FARMER'S MAGAZINE.

DECEMBER, 1852.

PLATE I.

A HEREFORD COW,

Bred by the Rev. Henry Blissett, of Letton Court, Herefordshire; the property of Mr. William Vaughan, of Cholstrey, near Leominster. To this animal was awarded the first prize of Ten Sovereigns and the Gold Medal, in class 3, at the Midland Counties Cattle Show, held at Birmingham, in December, 1851; and also an extra prize of Fifteen Sovereigns as the best cow or heifer of any breed.

PLATE II.

DANIEL O'ROURKE,

THE PROPERTY OF JOHN BOWES, ESQ., STREATHAM CASTLE, DURHAM.

ENGRAVED BY E. HACKER, FROM A PAINTING BY H. HALL.

Daniel O'Rourke, bred by his owner Mr. Bowes in 1849, was got by Irish Birdcatcher, out of Forget-me-not, by Hetman Platoff, her dam Oblivion, by Jerry, — Remembrance, by Sir Solomon out of Queen Mab, — Sister to Mercury by Eclipse. Daniel O'Rourke is a light chestnut horse, standing not quite fifteen hands high: he has rather a small neat head, strong neck, very good shoulders, deep girth, immense ribs and quarters, with powerful loins, thighs, and arms. He stands short on the leg, and is of great length, with very good bone; in fact, altogether just the multum-in-parvo compact kind of horse to go through deep ground. He has no white beyond a taste on the forehead, nose, and near hind fetlock joint. In temper he is generally quiet, but resolute enough when once roused.

THE CULTIVATION OF OATS.

BY T. ROWLANDSON, C.E., F.G.S.

The following treatise was written in reply to a series of inquiries respecting oat culture; since which it has undergone the examination of several practical agriculturists. The only remarks elicited in objection to what has been stated are inserted as foot-notes, to which are added some brief explanatory observations. Under all circumstances, therefore, it may be considered as having escaped pretty well from the ordeal of criticism, and the writer trusts that the article is not an unfair manual of oat cultivation.

According to the Linnæan arrangement, the oat is classed in the order Triandria Digynia; but by the natural system of Jussieu, it is placed amongst the order Graminæ, and in the tribe of Bromes, the major part of which species delight in rich moist soils, of a moderate degree of firmness. It is not known from what country oats were originally obtained; though it is said they have been seen growing wild on the island of Juan Fernandez. As, however, oats were grown in the old world before the new one was discovered, the truth of such a circumstance would by no means throw any light on its original *habitat* in the former.

Soils best adapted to oats.—When in good tilth, few soils are inimical to the growth of oats, chalks probably being least adapted to their cultivation. Any soil in *high* condition will produce good crops of oats. So far as *mere* soil is concerned, no species can be selected as peculiarly prejudicial to this plant. In common with most of the cultivated plants, oats do not grow well on undrained lands, particularly peats. Under these circumstances it will, perhaps, present the clearest view of the adaptation of various soils to the culture of oats, to review them under different classes, commencing with those most congenial, and concluding with such as are least adapted to their growth.

Mouldy loam and warp lands.—Although the oat crop will generally yield a profitable produce on lands where barley would fail to do so, it must not from that circumstance be considered that rich barley or wheat land is unfavourable to its cultivation, for there is no crop known to the husbandman that so clearly displays any attention paid to it, whether as respects extra management, or by being sown on rich land. Oats can be profitably grown on soils too poor for the successful cultivation of the other cereals (rye excepted); and all the intermediate stages of fertility, up to rich virgin land, which if sown with wheat would produce little more than straw. In cultivating very rich warp lands for the first time, this over-luxuriance sometimes occurs with the oat crop. After the drainage and inclosure of some of the richer peat and marsh land of Lincolnshire, crops of oats were in many instances obtained, amounting to 80 and 100 bushels of light oats per acre, with very long straw. A few years' cultivation soon reduced this exuberance. In the solitary instances where farmers have to contend with over fertility, a crop of hemp, if circumstances are otherwise favourable, should be taken, after which the ground will in general be found sufficiently reduced. From these remarks it will be seen that oats may be cultivated on very varied soils, under very different states of fertility. With respect to climate, oats will flourish under an extremely wide range, both of temperature and moisture.

These being the general characteristics of the oat plant, it may easily be conceived that the heaviest crops with regard to quantity, and the best with respect to quality, are obtained from those soils which are most productive in the ordinary range of general arable and pastoral husbandry: on such soils, in high condition, oats are apt to remain green too long, if the season proves moist; but during dry seasons they ripen very early, and are uncommonly productive of both straw and grain, the latter being also of excellent quality.

Friable loams, stiff soils, and marls.—Perhaps no soil is so well adapted to the cultivation of oats during all the vicissitudes of climate as friable loams, situate on broken limestone. In the course of a series of years, during which the extremes of dry and wet seasons may have prevailed, soils of this class will be found to produce the most average quality and quantity, being in very favourable years inferior in both respects to the produce of some soils, but counterbalancing this by the fact of being superior in unfavourable seasons. This is owing in part to the different mineral division, and in part to the composition of various soils; for instance, mouldy loams and warp lands are generally during cultivation broken into minute particles, whilst friable loams are formed into larger fragments, in consequence of which the former retain, by capillary attraction, a considerable quantity of water, whilst the more open interstices between the clods of soil in friable loams permit the water to speedily sink down to the subjacent limestone rock, by which it is absorbed through the innumerable fissures invariably found on the upper surfaces of the limestone formation. Stiff soils and marls produce excellent crops of oats: on these soils, however, either very wet or very dry summers are injurious; in the former case converting the soil to the state of mortar, and in the latter baking it to a hard substance, so that the root cannot penetrate. The latter will be in a great measure obviated, and perhaps avoided, by sowing the crop tolerably thick, and pretty early, so that the ground may become well-covered before dry weather sets in. If sown late and thin, a most miserable crop will be the result. In average seasons of temperature and rain, with a favourable harvest-time, oats from marly soils are very heavy, often being 44 lbs. to 45 lbs. per bushel, and sometimes more. When in good condition, few soils produce *heavier oats* than marls in average seasons, though heavier *crops* may be obtained on richer and more open soils, such as those first described. Oats should always be sown early on stiff soils and marls, in order to escape the detrimental effects of early droughts: this, however, is ofttimes no easy matter to accomplish, for if sown when the soil is not sufficiently pulverized, the seeds frequently get enclosed in lumps of clay, in which case, if not sprouted and above ground before dry weather sets in, they never germinate. In this way it sometimes occurs that not more than one-half or one-third of the seed ever appears above ground. Although marls are usually stiff, they are generally better adapted to the cultivation of oats than clays, and will, under equal circumstances, produce better crops of grain, though clays more commonly produce a greater quantity of straw. The grain produced from clay soils has ordinarily a thicker

skin than that produced on marls, or, in fact, any other soil.

Sandy loams, peats, and fen soils.—Sandy loams in good tilth produce excellent crops of oats as regards quality, and in bad seasons they also produce the greatest quantity. This description of land is best adapted to growing the earlier species of oats, though late species have a better chance of being well harvested during unfavourable seasons on this kind of soil than on such as are of a stiffer and more retentive nature. Generally speaking, peats and fen soils are well calculated to produce oats—in fact, more oats on a given compass are produced on the fens of Lincolnshire than in any other part of the world. the quality at the same time being good. Moist seasons are the most prejudicial to the growth of oats on these soils. During dry years, if sown early, very heavy crops are obtained. Fens and peats are better calculated to produce the black varieties than any other sort of soil.

Sand and gravel.—In dry seasons, if not in very good tilth, the oat crop will be short, both in straw and grain. During seasons having a quick succession of bright dry weather and light rains, good crops of oats are obtained on sands and gravels; but as these circumstances only obtain in the course of what are termed good growing years, which may amount to only one year out of ten, they ought not to be ordinarily calculated on. In unfavourable years, whether resulting from too much wet or dry weather, gravels are inferior to sandy lands, and in very favourable years barely equal the latter.

Chalks.—It has already been observed, that chalks are the most unfavourable soils for growing oats. Chalks are much better calculated to grow leguminous rather than cereal crops. This remark is, however, intended to apply only to *real* chalks, and not to extend to many down lands, which are composed of a shallow superficial covering of friable loam, with a substratum of chalk. This last kind of soil, other circumstances being favourable, will grow excellent crops of oats.

Whether the effect of the cooler climate of Scotland, in producing superior Oats, can be compensated in the Southern parts of the island by any improvement in cultivation.—To the form of the question here put we at once demur, in consequence of not being aware of any well-authenticated experiment or sound reason ever having been adduced that in the slightest degree tends to show that a cooler climate than that found in the south of England is beneficial to the growth of oats; other circumstances being equal, it will on trial be found that the warmer climate of the south of England will produce better crops of oats than those obtained in the North, or in Scotland. The difference perceptible at the present time between the crops of oats obtained from the two districts is not owing to a variation in temperature, but to the amount of moisture present, and the quantity of rain which falls during critical periods in the several districts. So far as temperature is concerned, oats will grow well in climates warmer than that of the south of England. To other causes than variety of temperature we must look for the difference in the crops obtained in the districts alluded to. These causes will be found to consist, first, in difference of moisture; secondly, in difference of soils; thirdly, in difference of cultivation. Before treating on these points, it may be briefly remarked that we have great doubts whether as many acres of superior oats, both as regards quality and quantity, are grown in Scotland as in England. We shall, however, again refer to this when we treat of cultivation.

(a) *Difference of moisture.*—It has already been observed that the oat belongs to a tribe of grasses that delight in a rich moist mouldy loam. The great breadth of the land in the south of England, from which only poor crops of oats are obtained, is not of that description, being in general a compound of chalks, sands, and thin light loams on chalks, more generally known by the term downlands. In the west of England a different class of soils obtain, varying from stiff granitic clays to fine friable loams. The climate in Cornwall, Devon, and West Somerset, is of a humid character, and suitable for the growth of oats. On many soils in this district crops of oats could be obtained equal to those procured in the best farmed districts of England or Scotland. The reason why good crops of oats are not obtained in the West of England may be accounted for by the following quotation from Mr. Tanner's "Prize Essay on the Agriculture of Devonshire," in which he states, "*If the land is in good condition* barley succeeds wheat, and is *followed by oats*; if not, only *one* additional corn crop is taken." Under proper management, as good crops of oats can be obtained in Cornwall, Devon, and West Somerset, as are grown in any other district of the United Kingdom; yet the mean temperature of Devonshire is 51 degs. 5 secs., and the mean annual rain fall is 31½ inches; the average of the counties south of 53 degs. latitude being only 49 degs. 9 mins. mean temperature, with a rain fall of 28½ inches per annum. Generally the temperature falls with the quantity of moisture precipitated in the form of rain;* but it will be seen that in the case of

* The remark here applies to the upland character of countries which possess a high mean rainfall, the coldness of climate in such cases being more due to elevation than the amount of rainfall, the latter rather raising than depressing the

Devonshire, when compared with other parts of the country south of 53 degs. latitude, the reverse is the case; notwithstanding this, no one acquainted with the district would conclude that the climate of Devonshire is unfitted to the cultivation of oats.

(b) *Different qualities of soils.*—With respect to soil no comparison can be drawn between the soils of Scotland and the down land of the south of England. The soils from which the fine samples of Scottish oats are obtained being good wheat lands, on which, in many cases, wheat would be grown instead of oats, but for the climate being the reverse of that of the south of England, viz., the former being frequently too humid for wheat. Beautiful oats are grown on the upland loamy soils of Stirling, and also from the carse lands of Moray, and the northern counties of Scotland; but, generally speaking, few samples of good oats are obtained from Scotland which have been grown on light lands, unless amongst light lands are included cultivated peats; but on this class of soils the production of oats in Scotland falls greatly below that obtained from the low lands of Lincolnshire and the adjoining counties; in fact, in no district of Great Britain or Ireland is so great a breadth of land under oats as the extensive fen districts in the east of England, neither is there grown elsewhere an equal extent possessing so good an average quality, in this respect being much superior to the average of oats grown throughout Scotland. In the case of the Lincolnshire fens, the drier climate is compensated for by the moist character of the soil. The higher temperature of Lincolnshire is for the same reason advantageous, for it will be found that, cultivation and other things being equal, better crops will be obtained on the fens of Lincolnshire that such as will be produced on similar soils in Scotland.

(c) *Cultivation.*—The great art of husbandry consists in adapting processes and rotations to the soil and climate of any given locality; when, therefore, soil and climate are equal, a comparison can easily be drawn as to the propriety of introducing the practices of one locality into another similarly circumstanced; for instance, no good reason exists why the turnip husbandry of Northumberland, the Lothians, &c., should not be equally extended in Devonshire, particularly when we know also that the latter possesses like soils, with a somewhat similar climate. It is found perfectly successful in the west of Lancashire, Cumberland, Wales, &c. When one of the elements of the calculation only varies, it is practicable sometimes to adapt cultivation to the altered circumstances of the case; but when both climate and soil vary, no parallel can be drawn. The same reason which renders down lands unfavourable to the growth of oats also renders it unfavourable to the growth of turnips. If crops of swedes could be grown on down lands equal to those obtained in the north of England and Scotland, the probability is that equal, if not superior, oats could be grown in the south of England; but, unfortunately, neither turnips (swedes) nor rape can be grown on an average of years anything like equal to the crops obtained in the north; whilst the superior crops of swedes, rape, &c., obtained in Lincolnshire, &c., are principally indebted to the hygroscopic qualities of the soil, aided by its low position, which causes it almost constantly to remain in a damp state. If, with fair managing, a crop of 20 to 25 tons of swedes could be looked forward to, on an average, on the Sussex Downs, there would not be the slightest fear of obtaining a superior crop of oats the ensuing year, provided the swedes had been soiled by sheep; but the difficulty in this case, as in many others, lies in the first step; for, in consequence of the climate, turnips cannot be grown in the south of England equal to those produced in the north; the succeeding crop, be it oats or anything else, therefore suffers proportionally. The difference of soil might be made up by manure; but the difference in climate can be compensated by such means only in a very slight degree. It is evident, therefore, that to produce results with the oat crop grown in the south of England equal to those obtained in North Britain, the preparatory step must be a different one—that step must be one adapted to the climate and soil. Previous to entering on these details we will give a brief epitome of the various modes in which oats are usually grown.

No crop is so generally cultivated on a freshly-broken-up lea as oats: and so far as luxuriance of growth is concerned, no crop is better adapted for the purpose, oats of the best quality being grown on good old leas. The only objection to this mode is, that the oat crop makes so small a pecuniary return; otherwise, the system is a good one. The practice of growing oats on lea obtains throughout England, Scotland, and Ireland, and is perhaps the most generally-diffused system of any belonging to British husbandry. In the fens, oats follow rape, and turnips, soiled with sheep, the oats being succeeded by wheat. Sometimes barley takes the place of oats in this rotation. An immense weight of oats is annually grown in the fen districts in the manner described. The great bulk

thermometer, owing to the diffusion of latent caloric evolved from the condensed vapour precipitated as rain. This is explained in two articles by the writer on Climate, in the "Journal of Agriculture."

of oats in England, Ireland, and Scotland is grown after wheat, being generally—lea, oats, wheat, oats, lea; lea, oats, potatoes, wheat, oats, lea.* In the latter case, sometimes a crop of barley is interposed between the wheat and oats. In Ireland, the following course is frequently followed: Lea, potatoes, wheat, oats, once or twice, as the case may be. Potatoes after lea is more frequently followed in Ireland than oats after lea. On the upland districts and boggy soils of that country, oats invariably succeed potatoes. Whilst Ireland is under notice, it may be remarked that as fine oats are produced in the counties of Cork, Tipperary, and Limerick, under high cultivation, as can be obtained in Scotland; yet the south of Ireland has a higher temperature than the south of Scotland, thus demonstrating that fine oats are not produced in Scotland owing to its cooler climate. Under equal cultivation, the south of Ireland yields better general crops of oats than the south of Scotland; but the former are never brought to market so fine as the latter, in consequence of the mode of dressing, which, in ninety-nine cases out of a hundred, is by being merely screened in the wind, generally by females; notwithstanding which, and all the other disadvantages of inferior cultivation, oats in the Golden Vein not unfrequently weigh 46lbs. per bushel when brought to market. The superior samples of oats produced in Scotland simply arise from the fact of their being grown on good land, capable of producing fair crops of wheat; and also that on such soils the oat frequently takes the place of barley in the rotation—viz., after turnips, soiled with sheep. Fine crops of oats ought to be obtained after a 20-ton crop of swedes so soiled, which had obtained a dressing, prior to sowing the turnip-seed, of not less than 20 or 25 loads of manure, and this, be it remembered, on good wheat land. From experience, we know that the oats generally obtained from many soils in Scotland are not so good as those obtained in England and Ireland. The reason why Scottish oats possess such a high character arises from the fact that large quantities are grown to be sold at high prices as *seed oats*, by which means an acre of oats will often yield a money return greater than if sown with wheat. In other cases, it is found that, in consequence of the humid and cold nature of the climate, wheat is a very uncertain crop, particularly in the uplands north of the Forth and Clyde. Under such circumstances, the cultivation of the oat is very properly adhered to. Scottish farmers are the more encouraged to this, in consequence of oatmeal forming the staple food of the country, by which means a higher price is obtained than if they were grown merely for provender. For beauty of tillage, extensive breadth of land under, and high cultivation of the oat crop, combined with scenery harmonizing with the subject, we have never witnessed anything superior to that which is to be found on the gentle, swelling eminences rising from the Carse of Stirling. The above modes of management have been recapitulated for the purpose of showing that circumstances obtain in Scotland, calculated to force, in some degree, the production of fine oats beyond those which would repay a south-country farmer, leaving out of consideration the question of an inappropaiate climate. That the latter may be partially overcome, we believe. It happens coincidentally that a great portion of the soils of the south of England are not only the least appropriate for the growth of oats, but at the same time are most exposed, both from their composition and the nature of the climate, to undue dryness, both circumstances being unfavourable to their growth. It is a well-known fact that an arid soil may be rendered fertile by high manuring. That this should happen, may be attributed to two causes—viz., the hygroscopic quality of the manure, owing to the deliquescent nature of the salts existing therein at the time of application, or which are subsequently formed during decomposition in the soil; but principally to the fact that, by high manuring, the water absorbed by the plant contains the inorganic and azotized elements of its structure in a comparatively concentrated form. That fine crops of oats can be obtained in the south of England, under proper management, is certain, the two great points to be aimed at being—having the soil in a high state of tilth, and early sowing. We shall have more to say on the latter subject when we come to treat on the general management. Taking into consideration all the difficulties which a south-country farmer may have to contend with—viz., the combined effects of an unfavourable soil and unsuitable climate, so far as relates to the oat crop, we would recommend the following rotations—viz., to sow the oats immediately after the turnips have been eaten off by sheep; or the soiled turnips may be followed by tares,* soiled by sheep, or

* It has been remarked that the above is a bad rotation. The fact is that there are two rotations, and those generally followed. The rotations are, however, only alluded to as customary ones, not such as ought to be adopted.

* Respecting this recommendation it was remarked: "We do not approve of tares being introduced here before the seed crop, because tares take from the soil what the seeds require, and clovers never grow well when tares have preceded them either in a green or a ripe state." Seeing that clovers belong to the same class of plants (Leguminosæ) as tares, it might have been expected

converted into hay, and the land sown the following autumn with oats, which may be laid down with grass-seeds or clover. If lea land is broken up, oats may be taken as a first crop, though (other circumstances being favourable) potatoes will generally be found to pay best,* to be succeeded by winter tares, soiled, and, lastly, followed by oats and grass-seeds, clover, &c. The above rotation is made on the presumption that it is carried out on a stock-farm, where sheep-food, at critical periods of the spring, is very desirable. It is to be understood that manure is to be applied more or less, according to circumstances, to one or other of the crops; and for this purpose guano is to be preferred. No opinion is here given as to the profit which may be derived upon growing oats on south-country farms according to the above rotation, though, taking every circumstance into consideration, perhaps it will be found as profitable as any other. Oats being usually looked upon as a sort of waste crop, the money return per acre is generally low. In Lincolnshire, previous to the repeal of the corn laws, a crop of oats after rape, soiled, has not of late years been valued at more than £6 per acre, including the straw, the latter being usually consumed and trodden into manure in the straw-yard. The rotation usually followed in that county is as follows: Rape, manured and soiled, oats, wheat, fallow. It will in general be found more profitable on most south-country farms to pay attention to the growth of the leguminous tribe, such as tares, peas, clover, &c., rather than oats. As it is, however, desirable to always have a small quantity of oats for home consumption, and as there is also a constant but moderate demand for fine samples of oats in the south-country district, at prices more remunerative than those obtained in Lincolnshire, Ireland, or Scotland, it will perhaps be always advisable to grow them within moderate limits. That this can be done on down sheep-farms advantageously, by alternating with soiled turnips or tares, we are perfectly convinced.

Different varieties as suited to different situations and different purposes.—It will be difficult to enumerate all the varieties of oats in use, many of which are of local celebrity, though not generally known. Prior to giving the result of our experience we will make some lengthy extracts of comparative experiments detailed in the "Highland Transactions," they are generally made on varieties not much known in South Britain, whilst our experience has principally been with kinds not usually cultivated in the north. A writer in the "Highland Transactions" details the following comparative experiments with potato, Hopetoun, and early Cumberland varieties. He states, "The early Cumberland is so named from being raised by a gentleman in Cumberland, a few years ago, from a single head. In sample it is a longish grain, and more like the early Angus variety than the potato: colour, dark and dull. It is much earlier than the potato oat, as the latter is earlier than the Hopetoun. Of a comparative trial made on two ridges in the same field, the produce was found to be as follows:—

	bolls.	bush.
Potato	17	5
Hopetoun	17	4
Early Cumberland ..	24	0

but, the potato oat weighed a stone per boll. more than each of the other two.

The following comparative experiments have been made with respect to the Dyock and potato oats in 1841. In both instances the seed was sown broadcast at the rate of 5 bush. per acre; the straw of the potato oat was longer; reaped the 20th Sept.—the Dyock oat having been cut on the 31st August. The returns were for the potato oat 6 9-20 times the seed; from the Dyock oat, 8¾. The former weighed 36 3-5 lbs. per bush., and yielded oatmeal 17 3-20 lbs.; the latter weighed 40 lbs., and yielded oatmeal 21 7-9. Mr. Watson states it usually arrives at maturity from twelve to sixteen days before potato oats, and the higher the elevation the greater the difference:—

RESULTS AS COMPARED WITH POTATO, FLEMISH, AND KILMUDDERRY OATS SOWN IN THE SAME FIELD AT THE SAME DATE.

DYOCK OAT.					
Year.	Returns.		Returns.	Weight per bushel.	Late in ripening.
1835.....	8¾	43½ lbs. per bushel.	7	42½ lbs.	11 days.
1836.....	4½	43 „ „	3	39 „	17 „
1837.....	6¾	42½ „ „	5½	40½ „	14 „
			KILMUDDERRY.		
1837.....	5 7-10	41 „ „	5	40 lbs.	29 „
			POTATO AND FLEMISH.		
1838.....	10 1-6	42¼ „ „	8¾	42½ lbs.	12 „

that clovers would not do well on land previously *exhausted* by tares. In the above remark, the author presupposes that the land is kept in good heart, which would be the case if the tares are *soiled*.

* This is understood conditionally that the potato disease has passed away.

Date of Sowing and Reaping of Dyock Oat, with other particulars.

Date of sowing.	Quantity sown. qr. bush.	Extent of ground. Imp.acre.	Description of soil.	Date of ripening.	Produce. qr. bush.	Weight per bushel.
1835, Mar. 29.	1 0		Grey loam dry bottom.	Sept. 9	8 3	42½ lbs.
1836, „ 28.	4 0		Black loam stiff clay bottom.	„ 16	18 1	43 „
„ Apr. 28.	0 5		Hard poor clay—whitish. ..	Oct. 3	2 0	43 „
1837, „ 8.	1 2		Heavy soil on clay.....	Sept. 14	7 1	42¼ „
„ „ 17.	4 6		Thin free soil till bottom. .	„ 18	28 4	41 „
1838, „ 5.	4 3	5,375	Good hard black loam.....	„ 14	44 0	42¼ „
„ „ 20.	3 1	4,410		Oct. 10	15 4	41¾ „

Since the preceding was written, two valuable prize papers have been published in the "Highland Transactions:" they are exceedingly valuable, as indicating the qualities of different varieties; it must, however, be observed, that those varieties which are known in drier districts as being pre-eminently early are unnoticed; both writers, however, agree that, for general purposes, the potato oat is to be preferred; and this remark will be found to hold good throughout the British Islands, except in cases where great moisture, poor soil, low temperature, or great elevation exists, when one or more of these circumstances obtains some other variety may be found succeed better. The common black oat will, for provender purposes, be found to yield the best on rich moist soils, particularly on reclaimed bogs.

Our experience of the Hopetoun oat is favourable for the yield of straw, particularly on Turbaries; but only a moderate amount of grain, the latter being generally of good quality—in fact, all the Hopetoun's we have ever seen have only possessed a short pannicle: of the Birly, Siberian, dun, Barbachla, and Kildrummie we are not acquainted; on the contrary, the common black, Poland (black and white), potato, and Tartarian varieties we have had considerable experience over a great variety of soils and climatic characteristics. For a poor soil, with indifferent climate and elevated situation, perhaps none exceed the black Tartary. In the south of England this kind is well adapted for growth, on such places as Dartmoor, Exmoor, &c.; in the north it thrives on similar cold damp elevated situations. What are termed "Dutch Brews," potato, and Poland oats, are the kinds usually grown in the midland and eastern counties; the first are, however, much later than the last-named—the yield is inferior to the potato, and is now going much out of use. The Poland is an excellent sort, when an early crop is desirable—in dry years being often fit to cut in the month of July; and, if sown in February, this sort might, in favourable years, be cut in the southern districts in time to get a crop of turnips or rape sown. The white Polands are the most liable to be injured by moisture, whether arising from deficient drainage or from atmospheric humidity. Black Polands are well adapted for growing on elevated situations with poor soils; both kinds of Polands are very susceptible of frost when approaching maturity, and should therefore never be sown late—from the middle of February to the end of March being the most favourable season. The potato oat is best adapted for soils in good tilth; and, if the ground becomes well covered, does not suffer so much as other varieties from drought; for, if this occurs, a good crop of oats will be obtained, although the straw may only be very light. Polands are the least obnoxious to drought, as compared with any other variety of oat. Poland and potato oats are the only kinds that ought to be grown in dry climates—the former on rich, and the latter on inferior soils;* both ought to be sown early—in fact, this remark applies to all kinds of oats. The Poland oats differ in appearance from any other kind—never being found double—and are to be known by their possessing a small speck where other oats are joined double, and the slit or mark on the seed is very close; they are remarkably round, and have a thickish skin. The black Polands have a longer grain than the white. Attention to this description of the Poland is the more necessary, as other varieties often pass under the name of Poland.

The black Tartary are pre-eminently adapted for poor, cold, humid, and elevated situations; they also withstand the effects of spring and autumnal frosts better than any other variety; they are remarkable for having the whole of the seed hanging on one side of the straw. The black Tartary gives extremely heavy crops on rich soils, and will yield fair crops on poor cold and elevated lands, where

* On this it has been observed, that "We are of opinion, that the white Tartarian will be much more productive on poor soils than the potato oat." Respecting which remark, the author observes that if the land has been overcropped, the observation is true, but not so if the land is in good tilth; in the latter case, the potato oat will be found most profitable. A good farmer will never waste his time and labour in sowing oats on exhausted soils; of course, when the latter case occurs, Tartarian will succeed better than potato.

scarcely any other description could be profitably cultivated.

The following are extracts from Mr. John Mitchell's prize paper in the "Highland Transactions." From the experiments of two years, the following practical deductions may be made, keeping the particular soil, climate, and state of cultivation in view:—

1. That land pastured for two years gives a quarter of oats per acre more than land that has been cut for hay when in first year's grass, and pastured the second.

2. That there is a decided loss of nearly four bushels per acre in taking seed-oats, however good the sample, from a later to an earlier soil.

3. That there is an advantage in taking seed-oats from a more southern and well-cultivated district.

4. That where a fine sample of grain, together with a large return, is desired, the potato oat should be sown.

5. That where straw and quantity of grain, without regard to quality, is desired, the late Angus oat should be sown.

6. That although the dun oat has proved the most prolific in grain, yet it is of coarse quality and deficient in straw.

7. That the sandy, Birley, and early Angus are nearly alike in their properties; the two former having the greater weight of straw, and the last the larger quantity of grain.

8. That the Siberian has proved the heaviest sample of grain, but is inferior in its conjoined properties to the potato, the early Angus, sandy, or Birley.

9. That the Hopetoun oat is the most unsuitable of all the varieties experimented on.

The field upon which the above experiments were made was of a free clayey nature, resting upon a subsoil of clay; in some places open, interspersed with sandy veins; in others, retentive of moisture. The more tenacious parts had been furrow-drained, and the whole field subsoiled; so that the land was uniform in its qualities for growing any sort of crop. The climate was comparatively dry, being among the driest in Scotland (Elgin).

It will be pertinent to this part of the subject to remark that there is every reason to believe that by perseverance and attention varieties of oats may be obtained adapted to particular localities, superior to any that have heretofore been grown. On this head it has been remarked by Mr. Archbold, who obtained the medal of the Highland Society for raising improved varieties of oats, that—"On practical experience for four years I find it consistent to nature that improved varieties of oats may be obtained from amongst the crops of oats sown in the fields. They may be engendered by impregnation, by different kinds of oats sown in the same field, or sown in fields adjoining to one another, where the pollen may be carried by the action of the wind."

We would recommend farmers to pay attention to this subject, as the best oat for its general qualities (the potato oat) was discovered in this manner growing in a potato-field in Cumberland about the year 1788, from which all potato oats have subsequently been derived.

General Management.—From its general adaptation to such a variety of soils, climates, and degrees of fertility, added to great hardiness, the cultivation of this cereal has never had the same attention paid to it that is shown to the other usually cultivated grain crops. This may be partly owing to its less pecuniary value, and also to the circumstance of its capability of yielding a profitable crop where no other would be remunerative. Some conception of its wide adaptation to different climates may be formed when it is stated that oats are cultivated to the extreme north point of Scotland, in lat. 58·40; in Norway its culture extends to lat. 65°; in Sweden, to lat. 63·20; in Russia its polar limits correspond with those of rye; south of the parallel of Paris the oat is little cultivated; in Spain and Portugal it is scarcely known, except in the northern mountainous provinces of Biscay and the Asturias, yet it is cultivated in Bengal to the parallel of 25° north, the hot but humid climate of Bengal being more congenial to its growth than the colder but arid uplands of the Castiles. Oats are much cultivated in Germany on what are termed the Sauer lands, soils analogous to our uncultivated peats. Its hardy character and capacity for vegetating on poor and worn-out soils have caused little attention to be paid to any improvement in its ordinary cultivation: fortunately it does not need much attention. If sown on lea, it ought to be well harrowed down; if sown after turnips, potatoes, or wheat, the soil will generally not require much additional pulverizing; but if the land is foul it will be well to use the scarifier or cultivator to drag out the weeds, which ought to be collected, and carted off or burned. In choosing seed care should be taken to select a perfectly ripe sample, that has not been overheated or become musty, for no grain sprouts so irregularly as oats, particularly in dry seasons. The quantity of seed sown should be five bushels by the drill, and six bushels if sown broadcast, to the statute acre. Oats are seldom drilled, except in Lincolnshire and the adjoining counties: the result of drilling has been satisfactorily shown to be from ten to twenty per cent. in saving of seed and additional produce, besides the advantage of being so much more easily weeded after the drill. Few crops

derive more advantage from being rolled than oats, especially if from any accident or destruction by the wireworm the plant has become thin: in such cases rolling, accompanied by a dressing of two hundred-weight of guano, will produce most surprising effects; the remaining plants tillering out amazingly. The ordinary time of sowing oats is during March and April; if delayed later than April the chances are ten to one against the crop proving a productive one, as it may be stopped by the dry weather at the commencement of the season, from which it will be difficult to recover; and if the harvest proves late, is apt to be spoiled by an early frost, which blanches the whole plant in a most extraordinary manner, when in an immature state. Early-sown oats are invariably the best, and self-sown crops are generally productive ones. On this account we would recommend south of England farmers, particularly those on the chalk downs, to sow oats after spring tares soiled with sheep. The rotation might be as follows:—Turnips, manured and soiled with sheep; spring tares soiled; oats sown in autumn, and sown with clover in the spring, by which means the oat crop would generally be off the ground by the end of July, and in forward years by the commencement. Thus, a good bite of clover would be had by the end of August—the quality of the oats so grown would be very superior. On wet cold clays and peaty soils autumnal sowing of oats is not recommended, but on all dry soils it is to be preferred, unless counterbalanced by any particular inconvenience.

The produce and quality of oats vary greatly with circumstances, being from 20 to 100 bushels per acre, and weight from 28lbs. to 48lbs. per bushel.

Oats are more liable to the smut and blight than barley, but neither one nor the other of these diseases makes its appearance on well cultivated dry soils: in damp soils this crop is also subject to a disease called segging or sedging. It is usually found more profitable to mow rather than reap the oat crop. If the season will at all permit it, oats should remain in the stook a sufficient time to get thoroughly dry: there is the less danger in so doing with the oat crop, as it will stand seasonal vicissitudes after being cut better than any other of our grain crops. The best time for cutting oats is when a few of the grains still retain the slightest possible trace of green colour on the chaff. Very early oats, such as winter-sown Poland or potato sorts, may be cut slightly green with greater impunity than late kinds, as they will ripen in the stook rapidly during the hot weather which usually occurs during the months of July and August, by which time winter-sown oats will always be ready for the sickle or the scythe. The reason why oats should stand so long in the field after cutting, and before carrying to the stack-yard, is on account of the danger arising from the stack over-heating, as oats when ripe are much more prone to heat in the stack than either barley or wheat, whilst at the same time oats ripen much more unevenly than either of the grains just named; added to which is the fact that oats are usually cut in a more immature state than any other grain crop.

In consequence of the drier climate of the southern counties, the farmers in those districts who have flocks sustain great inconvenience from the end of March to the middle of May—that is, from the time turnips and rape go out to that when tares, clover, and rye-grass come in. This might be somewhat alleviated by pulling and storing some swedes, and giving them to the stock on the grass land, in conjunction with oat hay. Oat hay has many times been recommended, but has never received that attention which it deserves, as there can be little doubt but oats might be made one of our most valuable forage grasses. On down lands oats might be sown after soiled winter tares, by which means it would receive the benefit of the summer rains, and would be ready for the scythe by the end of August or the beginning of September. The land could at the same time be laid down with clover and rye-grass, to produce early spring feed.

Owing to the fact that the oat, in proportion to the weight of grain, abstracts a greater amount of the more valuable inorganic constituents of crops from the soil than wheat, whilst it assimilates about an equal quantity of nitrogen, it is therefore one of our most exhausting crops; its quality of growing on inferior soils being attributable to its greater powers of assimilating and abstracting its food from the soil and the atmosphere. The oat is admirably adapted for cultivation in moist and elevated situations. On dry soils and climates oats ought invariably to be sown in autumn; and the most profitable kind is the potato, unless a very early crop is wanted, in which case the Poland should be preferred. For elevated moors and peats of from 900 to 1,200 feet elevation, the Dyock and the Angus are about the best, whether cultivated for the grain or as a forage plant; but in such places it ought not to be sown before the middle of March or commencement of April.

Since the preceding was written I have had practical evidence afforded me of the correctness of the views previously detailed, as regards the benefits arising from early spring or even the autumnal sowing of oats, in districts similar to the elevated uplands of North Devon, and possessing a like moist climate. Being recently called upon professionally to make a survey of the "Poltimore"

gold mine, near North Molton, Devon, I found instances of spring-sown oats on Exmoor being carted home on the 10th November. Had they been sown the previous autumn, they might have been housed in good condition the latter end of last August, or early in the succeeding month.

ON IRRIGATION AND LIQUID MANURE—THE IMPEDIMENTS TO THEIR EXTENDED USE.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

The progress which the system of watering land is now making is of a higher importance than is generally understood. We are much too apt to confound the use of copious supplies of water, as in the great water meadows, with perhaps no less valuable use of liquid manure in much smaller proportions but in a richer state. It is true that to a very considerable extent the theory of these two important operations is the same; but still there is a wide difference in the practical operation. The water of rivers, to be of much use in this way, or water meads, must be used in large quantities. Its foreign matters are generally limited; and although these are the food of plants, yet still they do not constitute the chief advantage of river water irrigation. When, however, by the addition of town sewage or other foreign matters these stream waters become very materially changed, they then as weak liquid manures become still more valuable for irrigation, and this generally in proportion to the amount of impurity present in such waters.

It is thus that the water of the Hampshire Itchin and the Wiltshire Avon become more useful to the farmer after they have received portions of the drainage of the cities of Winchester and Salisbury; it is thus that the streams of Milan and the greatly smaller springs of Edinburgh are enriched, till in the latter city the sewage so far exceeds in bulk the springs with which they are mingled that it is rendered, from its richness, available a *second* time: that is, after flowing by its own gravitation over and enriching one large tract of water mead, it is raised by a steam-engine on to a higher level, and rendered again largely serviceable in irrigating another large tract of water meads.

The profitable application of these foul waters to the land soon led to the use of the steam-engine for the same purpose in two or three other places in Scotland, where sewage was not, it is true, available, but where liquid manure can always be produced: such as Canning Park Farm, Dunduff Farm, and Myer Mill Farm, in Ayrshire (400 Scotch acres), and at Mr. Harvey's farm, near Glasgow. In these instances the *home-stall* liquid manure is conveyed on to the land, and distributed either by iron pipes only, or with the addition of gutta-percha tubing. Still more recently, Mr. Mechi has conferred an invaluable benefit on the progress of this agricultural improvement by the introduction of the same system upon his farm of Tiptree; and his spirited example will be followed, there is little doubt, by many persons who have supplies of water not more copious than he possesses. Mr. Mechi, in fact, has only the land-drainage of a portion of his farm to serve as the basis of his liquid manure; his stream is one indeed nearly, if not entirely, the result of his own land-draining operations. Before we proceed to notice the impediments which too often prevent the use of brook or river water in irrigation, it may be useful to refresh our memory by a statement of the amount of the various chemical substances withdrawn from the farmers' land by ordinary crops, and the amount of those supplied by the use in irrigation of impure river water. The result of such an examination has recently been given by the General Board of Health, as well as the amount of these substances contained in the small river Medlock. The following is their estimate of the

QUANTITIES of the ELEMENTS of FOOD REMOVED from 100 acres of SOIL by the usual four-course sytsem; and the quantities which would be supplied by the excretions of 100 adult persons:—

	Carried away from 50 acres of Wheat and Barley, and 50 acres of Green Crops.	Yearly Excretions of 100 Adults contain—
	lbs.	lbs.
Potass and soda	780	827
Lime and magnesia ..	948	3158
Phosphoric acid	1549	1713
Silica	450	166
Metallic oxides.. ..	8	6
Sulphur and chlorine	21	87
Nitrogen	2681	2312

It is evident, then, that if all the excrementitious matter of a given population were returned to the soil, it would maintain in fertility more than as many acres as there are inhabitants, if those elements only which are shown to be deficient were added—viz., silica and nitrogen; the former of which would be supplied by the disintegration of the soil, the latter by the ammonia contained in rain. The re-

fuse, however, of such a town as Manchester contains enormous quantities of valuable matter; for instance, large quantities of alkali contained in soap; manure of horses, cattle, pigs, and other animals; and refuse from manufactories. The quantity of such matter varies exceedingly according to the changes in manufacturing activity.

On October 2nd, 1845, the river Medlock, according to the analysis of Dr. R. Angus Smith, brought down the following substances: and there is no reason for supposing that they were on that day in unusual quantity.

	Per Diem. Cwt.	Per Annum. Tons.
Potass	178	3,200
Soda	257	4,640
Lime	940	16,900
Magnesia	9	160
Phosphoric acid	71	1,280
Silica (in solution)	266	4,800
Alumina (do.)	18	320
Oxide of iron	124	2,240
Sulphuric acid	444	8,000
Chlorine	151	2,720
Organic matter, 1,355 cwt., containing 6 per cent. of nitrogen, or	80	1,440
Insoluble matter, chiefly silica, alumina, and iron	1,866	33,600

It will be noticed that five of the most valuable substances for agricultural purposes, viz., potass, soda, silica, phosphoric and sulphuric acids, are here contained in great abundance which now run to waste. The Irwell probably brings down twice as much as the Medlock of all these substances.

It may perhaps be not quite correct to conclude that the quantities of these substances brought down are always as great as on the day of examination: but if they be, the annual quantity of each, in tons, would be as is stated in the last column of the table. The matter contained in the water of the Irwell has not been ascertained, but it probably much exceeds that of the Medlock. Large quantities of materials valuable in agriculture, besides night soil, &c., are not included in the calculation, as, in consequence of deficient drainage, they do not at present find their way into the rivers. When the drainage is complete, the quantity of phosphoric acid, nitrogen, and the alkalies will be largely increased. The phosphoric acid at present brought down by the Medlock alone is sufficient to supply 95,000 acres of ordinary wheat crops, 184,000 acres of clover, 258,000 acres of potatoes, or 280,000 acres of oats. The silica in solution in the waters of the Medlock would supply 50,000 acres of wheat, and the other elements would respectively supply still larger extent of cultivation.

If, then, the farmer has access to a stream of any kind—whether bright or turbid—whether either already a liquid manure, or capable of being made so, by the addition of various decomposing substances—what are the obstacles which commonly prevent his availing himself of the adjoining waters? They consist, in general, of either want of a sufficient lease, or want of capital, or, in many instances, from the existence of certain water-mills whose owners claim the sole use of the water.

It is now ten years since Mr. E. Chadwick, in his valuable Sanitary Report, forcibly alluded to this power of monopolising the use of river water—a right far too often injurious both to the agriculture and to the health of the surrounding inhabitants. He remarks, p. 305: "When expressing to a gentleman who has actively promoted improvements in agricultural production in Scotland my surprise at the large extent of marshy district allowed to continue in a state of comparative sterility, sources of rheumatism, and fevers, and other diseases, he directed my attention to the following amongst other exemplifications:—About a mile-and-a-half distant from one of the towns in Scotland there is a moss about seven miles long with a small stream running through it, with a fall of about 25 feet. At the outlet of this stream there is an old corn-mill, which yields a rental of about £25 per annum. By the water being dammed up to turn this mill the whole now is impeded, and the consequent sluggishness of the stream occasions it to be choked up with weeds. Whenever a fall of rain takes place, the banks are overflowed, and not only is every improvement rendered impracticable, but on several harvests as much as £500 worth of hay has been destroyed at a time when a heavy fall of rain has occurred and occasioned an overflow. There is, in fact, hardly a stream of any magnitude in our island whose flow is not impeded by mill-dams. The town of Cambridge has thus suffered from the existence of a mill on the river Cam; Croydon from another, which dammed the water of the river Wandle back upon the town. Birmingham has been injured by a mill on the river Rea; and these are mere instances amongst the many. The case of Tottenham was, some time since, clearly described by Mr. James Dean, in his evidence before her Majesty's Commissioners for inquiry into the state of large towns.—(1*st Report, vol.* xi., *p.* 520.) He alluded to the case of a water-mill in that parish, which he describes as standing in the way of every agricultural and sanitary improvement. He was of opinion, that this mill by stopping the water which comes down the river Lea, and the water from the river Moselle, does injury to the

parish to the extent of at least £2,000 per annum. In this case no water can be diverted for household purposes, or for cleansing the town, or for irrigation or farm-yard purposes; it shuts up the outfall to the drainage of the marsh land, and much other land in the vicinity, and consequently it affects the value of the land and property almost of the whole parish. The extra expense which would be incurred by the mill-owner by the removal of the obstacle to these improvements would be little more than the expense of the erection of the steam-power, which would answer as well or better. 'I could bring forward,' added Mr. Dean, 'instances fromevery part of the country where I have been, of streams which should have a free flow, and should supply a town, tailed up from 10 to 20 feet, producing a sluggish flow; interfering not only with the whole of the drainage immediately adjacent to the town, but with the beneficial use of the water, for irrigation and other purposes, miles above and below it.' In the vale of Honiton a mill, the rent of which was, I think, £22 per annum, or not exceeding £30, I found standing in the way of a number of farmsteads, and interfering with improvements ascertained to be worth at least £1,000 per annum. I scarcely know one town or village in England with which there is a stream connected, and upon which there is a mill, where similar evils are not maintained by tailing up the mill-stream. It is scarcely an exaggeration to say that for every shilling of mill-rent, a hundred pounds' worth of injury is done to other property, setting aside all consideration as to the effect of a proper drainage on the public health."

Such, then, is the value—such the advantage—of the extended use of water and liquid manure; and such, too, are the impediments in the shape of water-mills, and other vested rights. The removal of the old mills which I have alluded to, is often difficult, not only because of their money value, but because they belong to public companies, corporations, or to ecclesiastical bodies. Surely some facilities might be afforded for the purchase and removal of these by Parliament. The improvements in the steam-engine have been such, that we need no longer rely upon the water-mills for a supply of flour. These will, it is true, sooner or later disappear, and make room for other mills not only free from the objections upon which I have been dwelling, but, on the contrary, by banishing mill dams, adding to the welfare of agriculture, and the health of the inhabitants of the country. It is true, I repeat, that this result will be sooner or later attained; but, then, in the mean time, whilst water-mills are thus slowly supplanted by better powers, the public health suffers; whilst the improved cultivation of the adjoining lands is rendered almost impossible.

IMPROVEMENTS OF HOMESTEADS, AND REMODELLING OF FARMS.

At the annual meeting of the North Staffordshire Agricultural Society, which took place on the 7th of October last, the following lecture, being suggestions for the improvement of homesteads, and remodelling of farms, was read by G. Harding, Esq., of Tern Hill, Shropshire.

At half-past ten o'clock a numerous company, principally tenant farmers, attended in the Board Room of the North Staffordshire Railway Company, for the purpose of hearing Mr. George Harding's address.

The chair was taken by the president of the society, Captain Mainwaring, who having briefly introduced the lecturer,

Mr. Harding proceeded to deliver the following address:—The subjects upon which I would wish to speak are few, though important, and I will not trespass upon your valuable time at too great a length. They are as follows:—

Firstly—Exchanges, and the desirability of landowners availing themselves of powers given for this purpose by an Act of Parliament recently passed, in order that they may concentrate their estates, preparatory to a better arrangement of their farms.

Secondly—On farm buildings, both as to their position and construction.

Thirdly—The formation of proper occupation roads.

Fourthly—Drainage.

Fifthly—The necessity of remodelling the fields by taking up numerous old and useless fences, and substituting a few new ones in lieu thereof.

Sixthly—The abolition of hedge-row timber, more particularly upon arable farms.

And lastly—The destruction of game where unduly preserved, but more particularly rabbits.

All of which I purpose to explain and elucidate, partly by plans and sketches, and partly by bringing before you actual facts which have occurred within my own practice as a land agent in this and the neighbouring counties; and I have to hope you will put a liberal construction upon my motives in thus venturing to appear before you, and receive what I am about to advance in the same spirit in which it is given, my only object being to benefit, if possible, those connected with the soil,

whether as owners or occupiers. I will proceed, firstly, as I have said, with exchanges, and commence by stating that near to where I reside there is a small farm of about eighty statute acres, and, from its inconvenient position, it entails upon the tenant (although not more than three-fifths are under the plough) the necessity of keeping four horses, whilst, if by any means this land could be thrown together, two horses would be found ample for all the work of the farm. This farm, I presume, is rented at about 35s. an acre, and consequently at a gross rental of £140 per annum. The keep of these two extra farm horses I calculate at about £40 per annum, or nearly 30 per cent. upon the gross rent of the farm; add to this the inconvenience of driving a dairy of milking cows twice a day the greater part of a mile, and you will find a still further reduction in the value of the farm from the inconvenience occasioned by the land being scattered so widely apart from the homestead; and in order to elucidate the subject in question more clearly, I beg to hand to the meeting a tracing, showing the position of the farm as it now stands. In a parish nearer to this place than the one already mentioned I know another farm, a tracing of which I also beg to hand you; but as its inconveniences are about in the same ratio as the one already described, I will not trouble you with any details, and shall only add that such cases are far too numerous. If the gentlemen comprising this meeting, whether landowners or farmers, will take the trouble to look at these tracings, and judge for themselves, I feel assured they will at once agree with me when I state that such inconveniences as these at the present time amount to real grievances, and that it is highly desirable that landowners should at once avail themselves of the Act already alluded to, which will enable the owners of settled estates to get through these exchanges at comparatively little cost. This I consider the first step towards the proper arrangement of farms for letting, and I have to hope that this meeting will not think I have trespassed unnecessarily upon their valuable time in bringing the subject under their notice. My second subject, viz., that of farm buildings, is more familiar to me; and I come before you in the full hope of adding some little to the stock of useful information already possessed by your society. I shall first speak of their position, as it is too much the habit of landowners, when a farmstead is worn out, or nearly so (in order to save some little in the onset, or because some small piece of building is thought too good to sacrifice, without considering for one moment whether a better site cannot be found for the erection of the proposed new premises), to set to work and build upon the old site, and thus perpetuate all sorts of inconveniences for ages to come. That I may be better understood, I not only beg to call your attention again to the tracings already produced to the meeting, when speaking of exchanges, but also to hand you a tracing of another farm, showing the position of its present worn-out and ricketty buildings, which stand at the letter A on the outside of the farm, and which is not all: the produce grown upon, and the manure returned to, the land have to pass through a ravine of some forty feet below the seat of the homestead, and again to rise a still higher level to three-fourths of the land, thus entailing the necessity upon the tenant of using always three, and more frequently, four horses to convey loads, which, if the homestead were properly placed (at B), would be invariably done by two horses. Add to this the distance which has to be traversed to and from each field under the old arrangements as compared with the new, and I am strongly of opinion that this meeting will so far agree with me as to consider the matter of sufficient importance as to be worthy of their notice. Having said thus much as to the desirability of choosing proper sites for the homesteads, I will proceed to state my views as to their construction, and I shall preface the matter by saying the subject has never received that consideration which it so amply deserves; for although many premises may be found which have been erected upon the principle of extensive accommodation, still but little regard has been paid to the economy of labour in their general use. I take my stand upon the following grounds, and in which I hope to be borne out by this important meeting, viz., economy and simplicity of construction, combined with economy of labour in the general use of the various buildings; and, in order to assist me in this undertaking, I have prepared four plans of various homesteads, and which I will designate 1, 2, 3, and 4. The first is designed for a mixed dairy and arable farm of about 140 statute acres, belonging to the worthy president of your society; the second (consisting of outbuildings only) is now in process of erection upon a dairy farm of about 220 acres upon the estate of Charles Wickstead, Esq., at Baddely, near Nantwich; and the third is designed (and will shortly be carried into execution) for a dairy farm of about 200 acres belonging to Sir John Chetwode, situated at Lower Whitley, in the county of Chester, all valuable and esteemed clients of mine. The plan marked 4 is designed for an arable and house-feeding farm of about 300 acres, one-fifth of which is supposed to be in meadow and pasture; all of which plans I beg to hand to this meeting, and to place at the disposal of your valuable society, if they should find them, on examination, worthy of notice. An enterprising young man—

Mr. George Kettle, of Newcastle—having kindly supplied me with a gratuitous model of the last-mentioned plan, I will, with its aid, proceed to explain the claims which I hope it will be found to have upon your notice. Having so far explained, by the aid of this model, the various uses for which the buildings are designed, as, also, their economical points of construction, I must leave it to this highly respectable meeting to say how far I have succeeded in proving the "simplicity and economy of their construction, combined with economy of labour in their general use;" and if I have attained this object, and shown how desirable it is that the tenant-farmers should have every needful accommodation, I trust I may be excused for calling the serious attention of landowners to so important a subject. I now propose to proceed with a few observations on the necessity of establishing a better class of private occupation roads. These are frequently so bad through farms, that fifty per cent., or more, of horse power is required to pay the needful loads that have to pass and repass along them, as there can be no doubt that two horses will convey a greater weight upon a good hard road than four will upon a bad and soft one, and it is, therefore, a subject I conceive to be worthy the consideration of the landlord, as tending to economise the horse labour of the farm. This may, I think, be done fairly by the joint efforts of the landlord and tenant; the landlord fencing (where required) and forming such roads, and also providing the necessary material at the nearest convenient place; the tenant doing the team work only. By this method the expense would be fairly shared by landlord and tenant, an eat good would result to both. On draining I propose making a few observations, and I think that all will agree with me that the time has arrived when the land requiring to be drained should be at once and effectually done; and I will not, therefore, stop to point out the necessity that exists for draining, but at once proceed to what I conceive will be found the best method of effecting so desirable an object. Draining has hitherto been executed in a variety of ways: in some few instances the tenant has been at the entire expense; in others it has been done by the landlord, charging the tenant a per-centage, or not, as the case might appear to require: but the more general plan has been for the landlord to find the necessary draining material, the tenant performing the teamwork and all requisite labour. The first-named plan is entirely out of the question, and to the last there are strong grounds of objection; for whilst there have been some lands effectually drained by this method, there is reason to fear that there has been a great deal executed most imperfectly, and I have come to the conclusion that the safest method is that the drainage should be done by the landlord, charging a fair and reasonable per-centage on the outlay; by this means the draining would have a fair chance of being perfectly and effectually executed, and I think there is not one present in this meeting who will not join me in stating that benefit would result to both the landlord and the tenant. My next subject is that of the necessity there exists for remodelling the various fields of the farm, getting rid of a vast number of old and useless fences, and substituting a few new ones in their stead. To elucidate this, I will bring before the meeting a case of rather narrow limits, but it will, I think, serve to show that the matter deserves consideration. A short time since, a portion of a farm, comprising eleven fields and containing about eighty-four acres, was taken in hand by the owner. The old internal hedge-rows being crooked and bad, it was decided that the greater part of them should be taken up, and two new ones planted (one of the old ones remaining, as being tolerably good, and running in the right direction), thus making the eleven small inconvenient fields into four of fair and suitable sizes. The advantages derived were as follows:—The internal fences were reduced from 357 roods to 100 roods, thus saving the annual maintenance of 257 roods of fences; two acres of land were made available for crops heretofore occupied by useless hedge-rows, and nearly all timber was got rid of: the gates were reduced in number from sixteen to seven, and then, under the new arrangement, there is a gate into each field from the road, and also one between each of the fields; 10 per cent. is saved upon all the ploughings, harrowings, and workings of the land, and considerable advantages are also derived, particularly in harvest, from free access of sun and air. In order to be better understood, I have reduced these various items to a money calculation, and find the advantages amount to £10 16s. 6d. per annum—therefore, taking the value of the land, including tithes, at 28s. an acre upon the 84 acres, or £117 12s. as the annual rental, you will find the advantages somewhat exceed 9 per cent. on the rental. The whole cost of this, exclusive of timber in the rough for gates, gate-posts, and posts and rails, has not exceeded £28. This, divided in equal proportions between landlord and tenant, would scarcely be felt by either. Having shown the advantages to be derived from pursuing this method of remodelling, I think it may not be out of place to state how so desirable an object may be easily effected by the joint efforts of landlord and tenant, and at no great cost. My proposition is, that the landowner shall plant and properly guard all new fences, and that the tenant shall take up the old ones that may be necessary, in addition to

performing the needful teamwork, which method would, I think, divide the expenses in about equal proportions between the landlord and the tenant, and from which, I feel assured, great good would result to all parties concerned. Hedge-row timber (more particularly upon arable farms) I would next speak of, as I think this is a subject in which there is great room for reformation; for I really cannot think it is consistent that a farmer should first pay to his landlord a fair rent in money, and then upon that rent be taxed with a considerable per-centage in the growth of timber for the landlord's use, to the great detriment of the farmer. Of this I will give a very feeling instance upon the farm in my own occupation. It happens that I am a neighbour to a gentleman somewhat fond of his timber, and in one hedge-row adjoining my farm, of the length of 480 yards, there are 26 trees, principally ash. Upon this field I had Swedish turnips in 1849, and whilst the produce upon the other parts of the field yielded 24 tons to the acre, the portion (about 1 acre) affected by these trees gave about 12 tons to the acre, or half a crop, as compared with the remainder of the field. The preparation for this crop had, with the workings, cost me about £8 an acre, exclusive of rent, and the loss upon this acre by these trees I conceive amounted to £6. In the barley crop the loss was about in the same ratio; and the clover and wheat crops have also suffered materially. In the course of the four years' tillage, I therefore calculate that I suffered to the extent of about £12 upon this acre of land, giving £3 per annum, and as this is a field of about 16 acres, the rent of which may be stated at £30 a year (including the tithe rent-charge), it will be found that I am taxed with the addition of 10 per cent. by this hedge-row timber. I hope this little instance which I have given will be sufficient to show the landowners of this district that it is a subject worthy of their consideration, and that they will also bear in mind it is one over which a tenant has no control; besides this, the amount realised by the sale of these superfluous trees would aid in carrying out some of the matters already spoken of. My last subject is the destruction of game where unduly preserved, but more particularly rabbits. It is admitted by most, if not all, that the time has arrived when it will not answer the purpose of the farmer to trust to the natural productions of the earth; but that both skill and capital must be employed to increase those productions; with this, surely, the time has also arrived when crops so raised should not be destroyed by game; and I do hope that the landlords of this important division of the county will take this matter into their serious consideration. And whilst I would by no means interfere with the fair and reasonable recreation and sport of a landowner or his friends, I must confess there is something repugnant to the feelings of a tenant who is disposed to cultivate his land well, to feel and to know that the right of stocking his farm and consuming his crops is conceded to another party, and with whom he is frequently brought into collision. I have an instance, gentlemen, which I think it is my duty to bring before you, of the enormity of the system of preserving game. In the course of my practice a few years since, I was called upon to inspect damages done by game upon a farm occupied by an improving tenant in this district, and you will be rather surprised when I tell you that those damages exceeded the sum of £84 upon the corn crops alone upon a farm the rental of which did not exceed £250 per annum. Add to this the damage done to winter vetches, turnips, clovers, and grass lands, and in all probability you will find a sum that would amount to two-thirds of the entire rent. This, I conceive, is scarcely a proper state of things; and although the subject is a delicate one, I do hope it may have your grave consideration. Having proceeded so far in detail, I will merely recapitulate the various subjects, viz.: Exchanges, farm buildings, occupation roads, draining, remodelling fields, destruction of hedgerow timber, and of game where unduly preserved: and will now ask the landowners of this meeting, whether all these things do not bear upon the rental value of the land, and whether it does not become their interest, as it is assuredly their duty, to look seriously how their individual cases are affected by all or any of them. From being a native of this part of the county, and having been actively employed in it during a practice of thirty years, I think I may say that I have a fair average knowledge of the district, and have no hesitation in saying that there is no estate to which some of the above observations will not apply. Gentlemen, I consider that these are the foundation stones to be laid by landowners for an improved agricultural system, and without them the strivings of tenants will avail but little. Good farming is the capstone of our agriculture; but the foundation for this stupendous work must be laid by the owners. I cannot conclude these few and imperfect remarks, without reminding you that you have in the midst of you a consuming population of 100,000 persons, which is daily increasing, and have, therefore, a ready market secured for you at your doors—a great incentive for the improvement of your estates. It now remains, Mr. President and Gentlemen, for me to thank you for the kindness with which you have heard me, and if I have this day succeeded in adding one iota to the stock of important knowledge already possessed by your Society, and contributed to the welfare of my fellow-labourers in agriculture, I shall be happy indeed.

PRIZE FARM OF THE MANCHESTER AND LIVERPOOL AGRICULTURAL SOCIETY.

MR. JOHN WARBURTON, SANDIWAY HEAD.

INSPECTOR'S REPORT.—This claimant's farm is 152½ acres, and is held on lease for 14 years. The description of soil is one part peaty moss, another part sandy soil, and the remainder heavy strong soil on a clay subsoil. The cultivation is as follows:—Land in pasture, 63 acres 3 roods; meadows and seeds mown, 27 acres; irrigated, 9 acres; not irrigated, 27 acres; wheat after potatoes, 8 acres; do. after turnips, &c., 2 acres; oats after leys, 8 acres; do. after do. and wheat, &c., 12 acres; barley, 5 acres; vetches and rye, 3 acres; potatoes, 9 acres; turnips, 6 acres; mangold wurzel, 5 acres; carrots and parsnips, 1 acre; orchard and gardens, 1 acre; homestead and roads, 2 acres; total, 152 acres. Rotation of cropping: 1st, oats; 2nd, potatoes, turnips, mangold wurzel, carrots, &c.; 3rd, wheat and barley, with seeds; 4th, oats after wheat, sown with grass seeds, the same being covered in autumn, after the oats are cut, with bone dust. Stock kept on this farm: 4 farm horses, 1 bull, 30 dairy cows, 10 heifers, 6 rearing calves, 175 sheep and lambs, 30 pigs; total, 256. (Note.—From 170 to 180 sheep are sold off annually.) The horses, in summer, are three months out at grass, and in winter are fed on cut hay and wheat chaff, or on cut straw mixed with crushed oats and carrots; for two months in spring they have rye and vetches given to them. The cows are out at grass from the beginning of May until the month of October; then housed and fed on straw and turnips until calving time (say February or March), then they are fed on hay, mangold wurzel, and ground oats. Claimant makes from 300 to 400 tons of manure annually, which is principally used for potatoes, mangold wurzel, and carrots, and any remaining is put on the grass land. The whole of the liquid manure is collected in a covered tank. The claimant also buys annually 12 tons of bone-dust, two to three tons of which are used for turnips, and the remainder is put upon grass land for pasture. He also purchases two tons of guano, which, mixed with bone-dust and salt, is used for mangold wurzel. Ten tons of farm-yard manure, 2 cwt. of guano, and 2 cwt. of salt is also used for mangold wurzel; and for carrots and turnips, 10 cwt. of bone-dust, 2 cwt. of guano, and 2 cwt. of salt is used per acre. Claimant has drained eight acres annually for the last three years, and 110 acres have been drained within the last 15 years, principally with tiles and slate soles. Claimant drained eight acres of moss land last spring with pipes, the mains with four inches and branches two inches. All the expense was borne by himself, except the tiles and slates, which were provided by the landlord at a cost of £19. Claimant last year marled three acres, and since the year 1834 has marled 69 acres of this farm at his own expense. He has bone-dusted all the farm, filled up 17 old pits, eradicated 300 rods of old fences, raised new ones, and found rails, posts, quicks, &c., all entirely at his own expense. He has also filled up a bog, and drained the same, at a cost of £30, by which means 57 perches of land have been gained. He has also deepened, by an average depth of 18 inches, a small brook which runs through the farm, at a cost of 10d. per perch, in order to obtain fall enough to drain the land through which it passes. The length deepened was 1847 yards, and the cost £14. There has also been a manure tank erected by claimant, at a cost of £25, towards which the landlord contributed £5. All the meadow and pasture land on this farm is in high condition. The wheat remarkably clean, but its produce only medium. The crop had evidently suffered from the light and open nature of the soil. Of the oats, those after leys were a good produce, and those after wheat were equal to the best crop the inspectors have at any time seen, both in weight and quality. The barley was a full and clean crop; all the green crops were in the highest state of cultivation. The house, yards, garden, and fences were most satisfactory.—*Report of the Liverpool and Manchester Agricultural Society.*

BENEFIT DERIVED BY FARMERS FROM LECTURES SHOWING THE APPLICABILITY OF SCIENCE TO AGRICULTURE.

At the Dorsetshire Agricultural Society's meeting, the CHAIRMAN presented the handsome massive tankard, value £20, offered by H. Ker Seymer, Esq., for the best crop of roots, not less than forty acres, and which had been adjudged to

MR. EDWARD POPE,

with many highly complimentary remarks, declaring that he had never felt greater pleasure than in bestowing so handsome a gift upon a gentleman upon whom it reflected so much credit.

Mr. E. POPE, in reply, said, he had felt that if he gained this prize he should reach the height of ambition. He had certainly always taken the greatest interest in turnip cultivation, and from the observation he had been enabled to make from attending lectures and from having acted as a judge, he had seen the best system to pursue to arrive at this end. He returned Mr. Seymer his warmest thanks for the very handsome and munificent prize which he had given him an opportunity of being the owner of, and then said he would explain the mode he had adopted. It had not been the result of a lavish outlay in artificial manures, but after hearing the able lecture of Mr. Nesbit, in that town—(Hear, hear)—he set to work. He certainly bought bones of Mr. Ensor, but instead of putting them with sulphuric acid, and making them into superphosphate of lime, he threw them into a shed, and treated them with liquid manure until they had almost dissolved, constantly mixing them with ashes. About the time for ploughing them in he put 25lbs. sulphuric acid per sack to these bones. Then when he used guano he put one cwt. guano per acre with a sack of bones, and mixed in this way with two cart-loads of ashes. Now for the application. Heretofore he had found in drilling artificial manures that a great body were deposited in the vicinity of the plant; that a rapid vegetation ensued, and that the plants burst away into a large leaf, but did not bulb as they ought to do. But after listening to Mr. Nesbit, he sowed his manure broadcast, put a ridge plough on the land, thereby throwing two surfaces together, and bringing the artificial manure between the surface of the ridge. He then drilled with a Scotch drill, without any further application of manure—the total cost of his artificial manure being £1 0s. 6d. (cheers). He assured them that he had not spared manual labour; he had horse-hoed them as many as two or three times. In conclusion, he thanked the company, and trusted they would always find that cup full at his house (cheers and laughter).

In reply to Mr. Manfield, Mr. POPE said, where he put 1 cwt. guano he put no superphosphate, and when he used superphosphate he added bones in their natural state. He had left his implements at Mr. Galpin's for inspection. (Bravo).

The CHAIRMAN thought they ought to be extremely obliged to Mr. Pope for his explanation. He was quite satisfied the ridge system was the best, for without it they could not keep their turnips clean, and he was quite satisfied that they could grow more on the ridge than on the flat.

AGRICULTURAL BIOGRAPHY.

(Continued from page 439).

LXI.—Floyd, 1697.

Edward Floyd wrote, "An account of locusts in Wales;" "On the spontaneous combustion of several hay stacks, &c." These essays were printed in the "Philosophical Transactions" of the period above mentioned, and hardly entitled the author to a place in an agricultural biography, as the matter was not formed into a book. But as other lists have inserted the name, our record follows the example.

LXII.—Donaldson, 1697.

James Donaldson, a native of Scotland, and one of the earliest and most useful writers on the agriculture of that country, wrote "Husbandry Anatomised," London, 1697, 12mo. The libraries of the British Museum do not possess this work, and nothing is known of the author except what is written above. Scotch writers place a high estimation upon the book, as a valuable production of that early time, and reckon it fully equal to any thing of the kind that had appeared at the date of its publication. Not having seen the book, our notice does not add or detract.

LXIII.—Nourse, 1700.

Timothy Nourse, Gent, wrote "Campania Felix," or discourses on the benefits and improvements of husbandry, containing directions for all manner of tillage, pasturage, and plantations; as, also, for the making of cyder and perry, with some considerations upon justices of the peace and inferior officers; on inns and ale-houses; on servants and labourers; on the poor. To which are added two essays—1 "Of a country house," 2 Of the fuel of London." The first edition of the book appeared in 1700, and the second edition in 1707. This writer uses no dedication, preface, nor introduction of any kind; the contents follow the title-page, and the matter begins on the next leaf. The first chapter, "On country affairs in general," shows the author to have been an educated and well informed person, and much superior to the common calibre of writers on agriculture. "What I have written on this subject" he says, "is not grounded on the reports and method of other authors, but upon my own observations, towards which I have had some small advantage by my long continuance in a private and country life." He reduces husbandry into three general heads—tillage, pasturage, and plantation; and recommends that land be fallowed every third or fourth year. Dung requires digestion or maturation, by reason of the seed which lie in the litter. One load and a half of pigeons' dung is sufficient for an acre of land; four loads of sheep's dung, eight loads of horse dung, and ten or twelve of cow dung. It is not known what bulk or weight of load is meant. Fresh dung is better for stercoration than an old putrid mass, as the saline or sulphureous parts of the dung are wasted, in which its vegetative power doth chiefly consist. Lime kills the weeds, corrects the coldness of the soil, and cherishes the grain. Four loads to an acre is a good dressing. It supersedes the use of marl. Burning of land is an excellent good practice, and the benefit to the land arises from the increased temperature. Wheat is steeped in urine or salt brine, and then floured with powdered lime. Snow preserves corn by the covering it affords, and newly broken up ground is to be sown with oats. The head lands of arable fields are to be left in grass, and grain is recommended to be thrashed and sold immediately.

Pasture grounds are improved by being sown with grass seeds, as clovers and sainfoin, which are very highly commended. Ray grass is a spiry benty sort of grass, and thrives on a variety of soils, but not so much in vogue as sainfoin. Top dressings are much advocated in all fine substances, especially malt dust where it can be got. The watering of land is well understood and directed. The extirpation of tall weeds, and spreading of mole and ant hills are duly noticed. The author recommends that all low ale-houses be abolished, and that magistrates exercise a vigilant care over the licensing of these resorts. The chapter on the poor does not suggest any scheme for their relief, but is merely observations on the means of avoiding poverty.

The essay of a country house describes at some length the form of accommodation of a country residence, and the pity is that the author had not favoured the succeeding generations with a portrait of this scheme, so that it could have been now delineated. On the subject of fuel the author recommends wood and charcoal, in order to prevent the smoke from coals.

Nourse's book occupies 354 octavo pages, and is the best publication of the kind that had appeared at its date. Nothing is known of the author beyond the attachment of his name to the work. He had doubtless been a country gentleman of some small landed property.

LXIV.—Smith, 1704.

Smith wrote the Husbandman's Magazine, in 12mo. No list of writers except Weston's notices this author, so that his catalogue is the sole authority for inserting it.

LXV.—Fleetwood, 1707.

William Fleetwood was born in London 1656, died in 1723; he was much admired as a popular preacher, and was successively Bishop of St. Asaph and Ely. Weston ascribes to him a book entitled "Curiosities of nature and art in husbandry and gardening, in 8vo., 1707." The Bibliotheca Britannica does not mention this work, but quotes the other book of Fleetwood's mentioned by Weston, "Chronicon Pretiosum," or an account of English money &c. The libraries of the British Museum do not possess the works, so that Weston's catalogue again constitutes our authority for the name.

LXVI.—Young, 1707.

Arthur Young wrote "Curiosities of art in husbandry and gardening," London, 1707. This is the same title and year of the work which Weston has given to Bishop Fleetwood, and some mistake lies between that list and the Bibliotheca Britannica, which quotes the work as now given. Arthur Young, an author in 1707, is nowhere noticed, except in the last-mentioned classification of writers. The well-known secretary of the Board of Agriculture, who bore that name, did not appear in the world for more than half a century behind this date of time.

LXVII.—Mortimer, 1707

John Mortimer, Esq., F.R.S., wrote "The whole art of husbandry, or the way of improving and managing of land; with the countryman's calendar, or what he is to do every month of the year." The book is dedicated to the Royal Society, and forms a thick octavo of 632 pages. The books are 15 in number, and each is divided into chapters on connected subjects. The first book has four chapters—on inclosing lands; of pastures, and meadow lands, how to improve them, and defend by banks from floods and tides; and of making hay; and of several sorts of grass seeds, as clover, sainfoin, and lucern,—ray grass, trefoil, and several other grasses. The second book has 6 chapters—of arable land and tillage; on ploughs, of which some are figured; and the square earth board is shown and recommended for stiff clays; the Hertfordshire wheel-plough is still much recommended; of ploughing and laying land in ridges; of sowing corn and steeping it. The third book has three chapters, describing the different natures of soils; the ability and power of production. The fourth book has seventeen chapters—

I. On the manuring and digging of lands, with observations on each sort of manure.
II. Of the burning of land.
III. Of chalk.
IV. Of lime.
V. Of marl.
VI. Of fuller's-earth.
VII. Of clay.
VIII. Of sand.
IX. Of earth.
X. Of sea-sand and weed.
XI. Of dungs.
XII. Of sheep's dung.
XIII. Of hog's dung.
XIV. Of urine.
XV. Of human ordure.
XVI. Of the dung of fowls.
XVII. Of several other sorts of manures, as ashes, soap ashes, soot, rags, malt dust, and the several soils each sort of manure is best for.

The fifth book has 25 chapters, on grains and pulse crops, the roots, and herbaceous plants. The sixth book, of 21 chapters, treats on the animals, fowls, and insects that stock the farm. The seventh book, of three chapters, describes the pests of the farm, in four-footed and feathered beasts. The eighth book has five chapters on the uses of corn, and the making of malt. The four chapters of the ninth book treat on the small tools of work. The tenth book has four chapters on buildings and repairs. Book eleven treats on the different trees in 21 chapters. The twelfth book, in 12 chapters, describes coppice woods. The thirteenth book has two chapters on the plants of the kitchen garden. The fourteenth book has 21 chapters on fruit trees. The fifteenth book has five chapters on English liquors, as ale, cyder, and fruit wines.

Lime is used at the rate of 160 bushels to an acre, and laid in cinders in a bushel to a pole square, covered with earth, and spread when dissolved—but better in being carried hot on the land. It makes corn grow with a thin bark, and does not last above five years. Forty bushels of soot were sown by hand on an acre, and produced a mighty sweet grass. The spade is figured for paring land to be burned, and is the same now used. Turnips are sown in broad cast on finely fallowed lands, in midsummer, and afford food for sheep, cows, and fatting cattle into the month of March. The crop is a great help to dry barren lands, and will grow on almost any ground—the fly and caterpillar often destroy them. The crop is thinned by twice hoeing, at an expense of 4s. to 9s. an acre, or in daily wages of fourteen-pence.

Stubble turnips were sown at this time of the cultivation of the plant.

The author says a bull should have a sharp quick countenance, forehead broad and curled, eyes black and large, horns long, neck fleshy, belly long and large, hair smooth like velvet, breast big, back straight and flat, buttocks square, thighs round, legs straight, joints short. The cow ought to have a broad forehead, black eyes, clean great horns, neck long and thin, large deep belly, thick thighs, round legs, short joints; white, large, deep udder, having four teats, and the feet large. Of sheep, he says, the ram must have a large, long body, forehead broad, round, and well rising, eyes cheerful and large, nostrils short and straight. The ewe must have the neck large and upright, bending like a horse's, back broad, buttocks round, tail thick, legs small and short, clean, and nimble, wool thick and deep, covering all the body; gums must be red, teeth white and even, brisket skinned, eye-strings ruddy, felt loose, wool fast, breath sweet, the feet not hot. Fat pastures are said to produce straight tall sheep, and hills and short pastures breed square ones; woods and mountains yield small and slender sheep. The observations are very judicious on the breeding and management of sheep, and differ little from the modern practice. It appears that many sheep were then rotted.

The "Farmer's Calendar," in directions of monthly work, would do credit to any modern publication.

The author thinks but few farms will afford the generally allowed increase of three rents; one for the landlord, one for charges, and the third for the tenant. A farm of 100 acres, let at £1 per acre, may be maintained for the charge of £100 yearly; but if let for £50 a year the charges will be more than double the rent; or there must be the quantity of 200 acres of land in the farm.

Mortimer's book forms a very large advancement in the progress of agriculture from the preceding authors on the subject; trees and fruits do still occupy too much room, but the animals are more largely introduced, and systematically treated. The work was much approved, was translated into the Swedish language, and published at Stockholm in 1727.

It appears that Mortimer was a merchant in Tower-hill London, in 1693, and became possessed of Toppings Hall, an estate of land in Essex which he very much improved. Some fine cedar trees yet grow there of his planting. He was author of some tracts on religious education.

LXVIII.—Snow, 1715.

T. Snow wrote the "Apopiroscopy, or a complete and faithful history of experiments and observations in several arts, sciences, and professions." The "terricultural" experiments and observations are on the sowing of seeds; on the dunging, manuring, and soiling of land, and of the nature of soil proper for several vegetables. The observations are wholly taken from preceding authors, and are contained in short sentences of recommendation. The book is very miscellaneous, as the name imports, and can scarcely be claimed as a work on any special subject. The date is 1702, though the author's name is always given in lists of writers in 1715.

LXIX.—Clarke, 1715.

George Clarke wrote "The landed man's assistant," in 12mo. No author, or book of this name and title, is any where found but in "Weston's Catalogue," so that his list of writers constitutes the authority for entering the name in our record.

LXX.—Jacob, 1717.

Giles Jacob, Gent., was born at Romsey, in the county of Southampton, in 1686; died in 1744. His father was a maltster; and, after serving the apprenticeship of the law, our author became steward and secretary to the Hon. W. Blathwayt, a celebrated courtier in the reign of William I., and who enjoyed much preference in that and the succeeding reign. He was a poetical and dramatic writer, and a most industrious law compiler. He wrote some works relating to country matters, and "The country gentleman's vade mecum," containing the improvements of lands, ploughing, and sowing of corn; reaping, mowing, hedging, ditching, and all sorts of husbandry; of horses, cattle, cures of diseases, and directions how to buy and sell cattle, and breed horses; of deers and parks: fish, fishing, fish ponds, and game; prices of timber, and all sorts of building and workmanship, and the art of measurements; rules for the management of a family, expense in eating and drinking; duty and places of servants; general account of gardening, and of natural philosophy, in several chapters; to which is added a general description of England, and especially of London; taxes, revenue, policy, great officers, and courts of judicature; and legal observations on the several chapters throughout the whole, and a poem in praise of a country life.

The work forms a volume of 129 pages in small duodecimo, and shows the writer to have been a person of very considerable learning. Unlike to Meager, Nourse, and Mortimer, the author had never practised nor lived among farming in any shape or form; but his active mind had made large excursions, and among other objects agriculture had attracted notice. He seized the prominent parts which formed the improvements

of the day, and placed them in the brighter view which arose from his education. Lands are improved by soiling, draining, watering, and grubbing. The first mode comprehends manuring, and grubbing means trenching by the plough or spade. Clover and ray grass are very much recommended, as being extraordinary things for enriching lands, especially by feeding them with sheep.

The wages of those times are given with much accuracy, and also the produce of crops. Reaping of wheat is 3s. to 4s. an acre; mowing of barley 1s. per acre; raking barley 1s. per acre; mowing and raking of oats is the same price; as also of grass. Daily reapers got 1s. 6d. per day for wheat and mowing barley, for men; for cocking 1s. per day. Women got 6d. to 8d. per day for raking and cocking barley, oats, and grass. Thrashing of wheat 4d. per bushel; barley and oats 2d. per bushel. The straw usually defrays the expence of thrashing. An acre of good wheat produced about 30 bushels; barley and oats 20 to 40, according to the quality of the land. Eight or ten sheaves of wheat afford one bushel of corn. All expense relating to corn, from the ploughing of the land to the marketable rate, is worth 15s. to 20s. an acre; and the expense of hay-making is worth about 3s. or 4s. per load or acre. Corn sold on the ground was worth: wheat in £2 10s. to £3 an acre; barley £1 10s. to £2; oats about £1. High pasture lands must never be mown, as it impoverishes the ground; but low meadows are refined in the herbage by the mowing of the grass. On the breeding of horses the author advises a strong similarity in the parents, and that they are well shaped, especially the mare, which the foal most resembles. Mares may breed from the age of 3 to 10 years. Young horses are not to be handled or broken to use till the age of four years, when the muscular frame will be strong and well knit, the hoofs tough, and the eye-sight good. Horses are hurt by too young endurance of harness and riding. The marks of a good cow are, full chest, thick on the ribs, hair lying smooth and shining, handsome, and round shaped; and a sheep being round, having a large tail, and full cod, are good signs. Cattle kept from Lady-day to Michaelmas should leave of profit 30s. a piece, which makes good interest of money, answers well—living, and to pay rent. If sold at Midsummer 20s. of profit is good pay. An ox weighed about 900 lbs., a cow about 500 lbs., wether sheep about 22 lbs. per quarter, and a ewe about 18 lbs. About ten fleeces of wool went to a weight, or 21 lbs., and sheep were washed for 2s. per score. Horses ran at grass for 1s. 6d. to 2s. 6d. per week; oxen and cows 6d. to 1s. according to size; wintering of cows 2s. per week, and summering 1s. per week; sheep 2s. 6d. or 3s. a score per week, and on a common 1s. per head in a year. Running of a colt 1s. per week. Yeomath, or grass produced after the hay is cut, is worth for the winter half-year one quarter of the yearly value of ground, which, if 20s. an acre, the yeomath will be worth 5s. or 6s.

The other subjects of the author's notice are treated in a similar manner, and on gardening and fruit trees the discussions are longer and more practical. The monthly directions are accompanied with what clothes are required to suit the weather, and what food to use. The yearly maintenance of an individual of a family is calculated at about £40.

No book of the same bulk ever contained the useful matter in the quantity of this little volume, which has never been noticed, and is carefully written by Weston as being an author, and no more is said of it. Agriculture has ever needed, and yet feels the want of educated men being employed in its practice, and it has derived most of its valuable advancements from persons of alien professions. Even when no originality comes from the labours of education on that point, the existing practice is adorned and rendered attractive. The poem is here added, which was written by the author in praise of a country life.

A country life, the rural seat I choose,
Where nature freely doth her charms diffuse;
A neat small house, near to a shady grove,
Where pleasant birds sing out harmonious love.
A river fine, not large nor deep, but clear,
With murmuring streams divert the greedy ear
An estate not large, competency good,
To relieve keen nature with a wholesome food.
A garden small, with curious plants adorned,
In pleasing shapes by skilful gardeners form'd;
Here nature variously her beauty shows,
The fragrant lily and the blooming rose.
The lofty trees put out their verdant shoots,
And by winter's cold the long impaired roots
In spring, with strength aud beauteous lustre rise,
Present a resurrection to the eyes,
And every field seems like a paradise.
Until the scorching sun with heat exhales
The nutritious moisture of the fertile vales,
And mother earth its vigorous strength hath lost,
Its prolific nature with female weakness crost.
Impotent's the fire, when water fails to serve,
It helps destroy, not vital life preserve;
And weak is the water, when the fire's no more,
It barren makes what fertile was before.
But when the elements in consort meet,
The earth is blessed with a product great.
So when the sun its radiant beams displays,
And every field enjoys its happy rays,
Refreshing showers the scorching earth relieves,
The dry vegetable new life receives.
The ground is pleasant in most distant views,
Throws off its russet, brightest green renews.
Then walking is a pleasant exercise,
It moves the thoughtful, and diverts the wise;

It health increases, and doth strength create,
Restores the patient to his pristine state.
The morning's lustre, and the sun's approach,
With exercise, recover a debauch ;
But when this sun absconds, this glorious light
Removeth from us, then approacheth night.
" Hyems " succeeds with rough and austere face,
But health affords unto all human race
Now rural sports in great variety,
So in the country there's no satiety.
Sometimes for hunt, sometimes for shoot and course,
Sometimes for fish, and all without remorse :
On beautiful banks, over a plenteous brook,
You drop successfully your baited hook;
O'er hills and vales you do your game pursue,
Still pleas'd with motion and with prospects new;
Till hunger keen takes off the edge of sport,
Then home to dinner with eager haste resort.
Eat plentifully the plain provided food,
With a stomach sharp and digestion good.
Dinner being o'er, your garden you survey,
View well the product, business of the day,
Let nought be uninspected that may prove,
Nature's ornament, generous passions move.
When night approaches with its dismal face,
With pleasure you your studies may embrace:
Sometimes a friend and bottle will be good,
And in this way right living's understood.
To this a pleasing female you may add,
Adorn'd with sense, and with strict virtue clad,
With her you spend your hours unemploy'd,
As the gallant with a mistress till enjoy'd;
With joy reflect upon the marriage knot,
And lovely children in honest wedlock got ;
To all other women you a stranger prove,
Let thy dear consort be thy only love ;
By this good way of living you'll be free
From stinging vice and all perplexity.
With health and strength spin out the thread of life,
Free from envy and the destructive strife ;
From noise, confusion, of the filthy town,
The country air in healing draught suck down ;
Not coop'd by debauchery or youthful vice,
With aged locks advance to paradise.
This is the truly happy earthly state,
Ought to be valued at the highest rate ;
Free from the care attending miser's wealth,
Adds peace and comfort to a vigorous health.
From greatness likewise free the courtiers' fate,
His pride, anxiety, unstable state ;
In courts of princes this maxim is understood,
It's dangerous for a statesman to be good.

LXXI.—Switzer, 1718.

Stephen Switzer was a gardener and seedman of Hampshire, in the reigns of Anne and George I. He wrote some books on gardening, and had extended his views beyond the walls of the garden, and looked at the policy and pleasure grounds, plantations, and at agriculture. On the latter subject he wrote "The country gentleman's companion, or ancient husbandry restored, and modern husbandry improved;" and "An account of the lucerne, sainfoin, clover, and other grass seed, with a method of turning clay for the dressing of land." This treatise had passed through three editions ; but the two works now mentioned are not found in the British Museum; but the chief work of the author is found: "Iconographia rustica," or the nobleman's, gentleman's, and gardener's recreation, containing directions for the general distribution of a country seat into rural and extensive gardens, parks, paddocks, &c., and a general system of agriculture, illustrated with a great variety of copper plates, done by the best hands, from the author's drawings.

This work is in three octavo volumes, of a thin size, in about 260 pages each. A long preface fills 15 pages, and the contents follow of each volume separately. A history is given of gardening from the earliest notice down to the time of the author, and is succeeded by an essay concerning earth, water, sun, and air, and the process of nature in vegetation. The raising of forest trees is treated, and of the timbers in parks and policies. The water-works are described that must be formed in pleasure grounds, with the grasses and gravel walks. Figures and delineations are given of the landscape gardening, plots and designs of various kinds, for the use of gardeners, with the application of instruments for the special purpose. Orchards and fruit gardens are largely treated, and woods and groves described and figured.

The agricultural part of the work occupies the second part of the third volume, and is contained in six chapters. The sections mention the subject matter, as the management and improvement of arable land by the plough, spade, &c.; of winter fallowing; of earths, and their improvements ; of the nature of dungs, sheep, and hogs, poultry; of marle, chalk, and lime, used before sowing ; the superficial dressings are, coal-ashes, wood-ashes, kiln-ashes, saw-dust, turf-ashes, lime, malt-dust, sea-sand, loame, loamy sand, burnt vegetables, soap and pot ashes, soot, rags, pigeon's dung, sea shells, burn-bating, burning of meadows and pasture ground by heath and fern, claying, and by enclosures ; of ploughs and ploughing ; of sowing; of draining of lands; the conclusion is on hop-yards and the management.

Switzer has ever been highly esteemed by gardeners of the higher degree ; and it must be added that the portion of his work on agriculture shows a very correct information, a quick sense, and a sound judgment. With the exception of some few crotchets, which enlightened practice has removed, modern farming finds nothing to reject in the writings of Switzer. The old doctrine about nitrous salts still lingered, but did not exist in much vigour since the days of Plat. It yielded to the gradual progress of scientific knowledge. Switzer died in 1745.

LXXII.—Bradley, 1721.

Richard Bradley, F.R.S., was professor of botany in the University of Cambridge, and a most voluminous writer on agriculture and botany. Died in 1732. Of his numerous works, the following ones relate to our purpose:—"Philosophical treatise of husbandry and gardening," London, 1721, 4to. "Treatise concerning the fallowing of ground, raising of grass seeds, and the training of lint and hemp," London, 1724, 4to. "General treatise of husbandry and gardening," London, 1726, 2 vols., 8vo. "Riches of a hop garden explained," London, 1729, 8vo. "A complete body of husbandry," London, 1729, 8vo. "Experimental husbandman and gardener," London, 1729, folio. "Proposals for the improvement of waste lands," London, 1730, 8vo. "British housewife and gardener's companion," 8vo, 2 vols., 1730.

The works of Bradley have never been properly distinguished—no two lists of authors agree either in the number or date of his publications. Additions were made from time to time, and there never has been a complete edition of them all. The above list has been selected as appearing to contain the chief works on our special subject.

The libraries of the British Museum contain only two of Bradley's agricultural works: "The complete body of husbandry," and "Gentleman and farmer's guide in regard to cattle." The first book is an octavo, of 372 pages, in 18 chapters, which treat of soils, water, air, and heat—their influence on vegetables; of manures; of manuring barren lands; of the making of potash; of composts, or mixt manures; of draining and watering of lands; of the improvements of bushy and mossy ground; of bushy ground never before arable; of improving furze, or gorse, or whin ground; of improving broom ground, and the use of broom; of the improvement of heath ground, and fern or brake ground; of the improvement of flinty or dry chalky ground, and of limestone land; of improving soils by means of the natural plants; of the improvement of ground by the shifting of crops; of the improvement of lands by enclosures, the repairing of highways, and the preservation of game; the method of stocking a farm of 300 acres of arable land; expense of stocking a grass farm, both of grazing and meadow ground; of horses, which is the concluding chapter.

The author quotes very largely from Fitzherbert, and mentions Hartlib, Houghton, and Mortimer. The subjects are most sensibly handled, and show a very well informed and comprehensive mind. The stocking of a farm of 300 acres of arable land costs £415, including £100 for household furniture. The profits of a ewe in the year is 5s., and of a hog 20s., and the poultry on such a farm will yield £40. The yearly expenses are £586 8s. 6d., including the rent of £150. The profits are £800, leaving £214 for clear profit yearly.

Bradley has introduced more methodical arrangement than the preceding writers on agriculture; but much still remained to be done on that point, one of the most important in all the records of writing.

The book on cattle and other animals is an octavo of 352 pages, in four chapters: On sheep; on swine, and their improvement; on the bull, cow, and ox; on horses. The sheep has the preference of being first treated, on account of the great value from the wool, flesh, tallow, and skin. The rot is much discussed—the causes and prevention. The falling, yeaning, and castrating of lambs, are fully described; and the severing the sheep and parting the flocks. The washing and shearing are well described, with a long quotation from Fitzherbert. The management of wool, and the application of it, occupy twelve pages. The distempers of sheep are accompanied with the cures, which concludes the first chapter.

The second chapter, on swine, reckons the creature kept with little trouble, and profitable in every part of it. It is the chief support of the kitchen, and the kitchen is the chief support of the swine. The farmer is very improvident who buys bacon, or seeks pork of the butcher; for there is to them who understand the management of swine a greater advantage than can accrue to those who keep the larger sort of cattle, either in breeding swine for pork or bacon. The edible parts of the hog afford more variety of tastes than either sheep, oxen, or twenty other creatures besides. After this eulogium on swine, the author describes the different kinds then living in England, preferring the black breed for sweetness of flesh, fecundity, and quick fattening. The cross between that breed and the large white hog is much recommended, as needing little care and yielding most profit. The author recommends an animal of the middling size: and, notwithstanding the old and very common opinion to the contrary, he thinks the pig is cleanly in its habits, and advises the comfortable accommodation. Not more than two broods of pigs must come from a sow within the year, as many farrowings will very injuriously weaken the animal. The very ample feeding of the sow with juicy food is strongly urged during the suckling period, in order both to support the sow and to rear a strong and healthy progeny. Barley-meal is much recommended, with wash, whey, and grains, and all juicy matters in a liquid form. Pigs are to be early learned to drink mixed wheys and other liquids. The sow may breed till six years

old, and then fattened. Good directions are given in the feeding of hogs for pork and bacon, for curing bacon and hams. The distempers of swine are then specified, and the remedies given.

The third chapter, on the bull, cow, and ox, begins with a view of what relates to kine from the ancient writers of husbandry. England has ever possessed some of the best breeds of kine, which are modified in the districts being barren or fertile in the soil. The counties of Lincoln and Somerset are mentioned as producing large beasts, generally of a red colour, or cross-stain, between them and the black. There were white cattle in Surrey, which yielded the richest milk, and then their flesh more readily received the salt. The best oxen had the following properties:—Large, well-knit, and sound limbs; a long, large, and deep-sided body; white-horned, broad-foreheaded, great-eyed, and black; ears rough and hairy; jaws large and wide; lips blackish, neck well brawned and thick; dewlap large, and hanging down from the neck to the knees; shoulders broad; hide not hard, nor stubborn to the feeling; belly deep; legs well set, full of sinews, and straight, rather short than long, the better to sustain the weight of the body; knees straight, and great feet, one far from another, not broad nor turning in, but easily spreading; hair of all the body thick and short; tail long, and big haired. Cattle bred on the ground are to be preferred to strangers. Milking cows are to be high of stature, long-bodied, having great udders, broad forehead, fair horns, and smooth, and almost all other tokens that are required in the bull; cows may breed till twelve years old. The first calf to be dropped at the age of three years, and come best in the month of March. Bradley recommended that all calves suck the dam. The vealing process is well described, and the calf pens have a vacant floor underneath. The diseases of calves are treated, and the cures prescribed. The manufacture of milk into cheese and butter is detailed at length, and a section is devoted to the breaking of oxen to the yoke or draught; a second to the structure of ox stalls; a third to the feeding of oxen; a fourth to the use of the parts of the body of kine; and another on the distempers of kine, and the cures.

The fourth chapter, on horses, treats the breeding and training of the animal in the various breeds which were then known and used. The cross between the Barb and the English mare is particularly related. The best horses are got from foreign stallions and English mares; black colour is hardy and enduring; white is delicate; chesnut and brown bay are strong and spirited; and the grey which tends to black is stronger than the white greys. The origin of the pie-bald colour is much discussed, but left unresolved. A fine-formed animal may not possess the requisite spirit nor strength. The bright bay colour, with black mane and tail, the bright bay, and the dapple gray, are the best colours, the most pleasing, and the most lasting. The breaking of young horses is accompanied with drawings of the bridles and saddles necessary for that purpose. This part of the work seems to be unduly lengthened, and is followed by a section on the distempers of horses and the cures, which concludes the work.

The work of Bradley is the first systematic production on the animals of the farm, and exclusively devoted to the special object. It possesses much merit, and is as well arranged and expressed as any modern work on the subject. Poultry might have been added, which would have completed the farmer's store of beasts that are reared for his advantage.

The industry and talents of Bradley were not mean, and, though unadorned by deep learning, they procured him a very reputable degree of respect with posterity, though it is said he was deficient in the upright integrity and propriety of conduct which, beyond any endowments of nature, stamp the character of a man. Be this as it may, he led the world both in agriculture and botany. His "Dictionarium botanicum" was the first attempt of the kind in England, and exotic botany was indebted to him for an undertaking which he did not live to execute. This was "Historia plantarum succulentarum," of which only five parts were published. His "New improvement of planting and gardening" went through several editions, as did his "Gentleman's and gardener's calendar." The same may be said of his "General treatise of husbandry and gardening;" and his "Philosophical account of the works of nature" was a popular, instructive, and entertaining work, and continued in repute several years. It seems Bradley had forwarded qualifications and urged pretensions which he was unable to vindicate and fulfil, and it was proposed to dismiss him from his professorship, when he died in November, 1732. A regret is due that any slur or blemish should attach to a name that dignified and forwarded a science and an art which have no superiors in enlightening the mind and improving the condition of the human race. The offence of Bradley was neither immoral nor criminal, and a just charity may decide that the good effected very much overbalances any delinquency that was incurred.

LXXIII.—Molesworth, 1723.

Weston writes, in his catalogue of authors, that Lord Molesworth was the author of "Some considerations for the promoting of agriculture and

employing the poor," Dublin, in 4to. Robert Viscount Molesworth, of Swordes, in Ireland, was an eminent statesman and polite writer, zealously espoused the revolution of 1688, and was sent by King William as ambassador to the court of Denmark, of which country he wrote "An account." He gave great offence in this work, and the fault lay on the side of the writer by universal opinion. It seems he was unlucky in his expressions, as he was more than once removed from the privy council of Anne and George I.; but he was much noticed: was a commissioner of trade and plantations, fellow of the Royal Society, and continued to serve his country with zeal and industry till the two last years of his life, which he spent in studious and learned retirement. He was Baron of Philipstown, and Viscount Molesworth, of Swordes, and died in 1725, at his seat at Breedenstown, in the county of Dublin. Few men of his fortune and quality were more learned or more highly esteemed by men of learning. He was intimate with Shaftsbury, and corresponded with Locke, and treated by all with the highest regard.

The libraries of the British Museum do not contain the book now mentioned; but it is written among Lord Molesworth's works in the accounts of his life and publications. A regret is due to the want of it on the subject of the poor, as that consideration still forms the grand puzzle of every social policy, and the enigma which defies solution. Probably the learned and benevolent mind of Molesworth may have suggested some remedy which, like all other applications for the public good, does not demand such a vast extent of natural parts, as an exertion of honesty, that is much beyond what the world has yet been blessed with enjoying or beholding.

LXXIV.—Knowles, 1724.

Weston states that George Knowles wrote a "Treatise on the manner of fallowing ground, raising of grass seed, and training lint and hemp," in 12mo. No other list of authors, nor any library of books, contains this work, though the other work is mentioned that is ascribed by Weston to George Knowles, "Materia medica botanica, poema." The insertion of the name in our biography rests on the sole authority of Weston.

LXXV.—Lawrence, 1726.

John Lawrence, M.A., was rector of Bishops Wearmouth, in the county of Durham, in 1721, and prebendary of Salisbury in 1723. He died at his rectory in 1732. His early attention to gardening produced several works on that subject, as "The clergyman's recreation," "The gentleman's recreation," "The fruit-gardener's calendar," "Paradise regained," a poem on gardening. He published in 1726 "The new system of agriculture," being a complete body of husbandry and gardening in all the parts of them. The volume is a large folio, in five books, of which only the first relates to agriculture. It describes meadows and tillage lands, ploughs and ploughing, sowing of grains, manures, the plants used in the various kinds; animals of all sorts, and the productions from them: minerals are added, and the working of the materials. The conclusion of the whole work treats the hindrances to improvements by reason of beasts and weeds. Elemental matters are largely discussed, which was a favourite topic with the olden writers, and not discarded in Laurence's day. This author did not add anything new to agriculture, but seems to have been well acquainted with the best practice of his time.

LXXVI.—Lawrence, 1727.

Edward Lawrence, land surveyor, was brother to the last-mentioned author, and wrote "Young surveyor's guide," London, 1726, 12mo. "The duty of a steward to his lord, with an appendix on farming," London, 1727, 4to. This volume contains 212 quarto pages, and a long introduction enumerates the evils and loss from improper stewardships. The duties of a competent steward are detailed in 36 articles, most of which are used in the best modern practice. He prohibits the keeping of rabbits, and much game of any kind, and forbids any grounds to be pared and burned. The ability and substance of a tenant should be well known before a farm is let to him, otherwise great inconvenience may follow, and loss to both parties. The sub-letting of lands is forbidden, and farms are to be augmented in size gradually as the terms of holding are expired. The work shows an enlightened knowledge of the subject, and contributes a large advancement in agriculture. The forms of cash and rental books are valuable even at this day.

A long appendix of 20 articles gives as many directions to the farmer on points of interest to the practice of his business. Clover and trefoil are much recommended, and lime in being rolled into the ground. Turnips are a great improver of land —must be hoed and well cleaned. The list of manures does not add any new substance, and the application to the soil is done as with the previous writers. The artificial grasses are clover, rye grass, sainfoin, lucerne, vetches, lentils, tares, and buck-wheat. Twelve pounds of clover sows an acre, 3 bushels of ray grass, 4 bushels of sainfoin, and 14 lbs. of lucerne. Vetches, in both the winter and summer variety, are great improvers of the ground.

The practical knowledge of this author was very correct and enlightened on every point, and he must be reckoned a very prominent character in the progress of agriculture. The hoeing of turnips, and the consuming on the ground by sheep, are well described and recommended. The regret is that he had not written more. The condensed mode of writing marks a new era in the agricultural world.

Weston writes Lawrence as being the author of the "Gentleman farmer," and "Proposals for draining Bedford level." These works are not found in any other list in attachment to the name of Lawrence; and, as Weston does not make any mention of Edward Lawrence, some mistake may have placed the work to a wrong name.

LXXVII.—Dove, 1728.

John Dove wrote "Strictures on agriculture, wherein a discovery of the physical causes of vegetation, of the food of plants, and the rudiments of tillage is attempted." He wrote in the "Philosophical Transactions" of a surprising shoal of pumice stones found floating on the sea, 1728, vol. viii., p. 234. This small volume occupies only 80 duodecimo pages, and is exclusively a philosophical essay on improving land, dearness of provisions, rights of property, and foolishness of governors who have only one eye, and blink with that. The author does not state any practical knowledge, and is little noticed.

LXXVIII.—Rye, 1730.

George Rye wrote "Observations on agriculture," Dublin, 1730, 8vo. This statement is written in the list of authors by Weston and London, and in the "Bibliotheca Britannica;" but the book is not found in the libraries of the British Museum.

LXXIX.—Mackintosh, 1730.

Brigadier Mackintosh wrote "Essay on ways and means for enclosing, fallowing, planting, &c., Scotland, and that for sixteen years at farthest," Edin., 8vo., 1730. This book fills 295 pages of small octavo, and contains besides, the "Essay on enclosing the nation, the laws for encouraging planting and policy, anent the manufacturing of linen cloth, and anent repairing highways." This essay argues very strongly in favour of enclosing lands, making plantations, and fallowing. The author seems to have been an educated person, and to have entertained very sound views and enlarged comprehensions.

LXXX.—Richards, 1730.

John Richards, of Exon, wrote "The gentleman's steward, and tenants of manors instructed," London, 8vo., 1730. The book is of 127 pages, and bound into a volume, with anonymous essays on agricultural subjects. It treats the values of freeholds, copyholds, and leaseholds, on lives and for years, with the disbursements and casualties that houses and lands are exposed to, with many tables for valuing estates on lives, with the use and description of an instrument for discovering the number of feet in any timber trees before they are cut down, by inspection only. The book could have been useful only in some few cases of occurring practice.

LONDON FARMER'S CLUB.

LECTURE ON THE USE AND ABUSE OF LIME IN AGRICULTURE.

BY J. C. NESBIT, F.G.S., F.C.S., &C.

Principal of the Agricultural and Chemical College, Kennington, near London.

The first monthly discussion, after the autumnal recess, took place at the Club Rooms, Blackfriars, on Monday evening last; Mr. R. Baker, of Writtle, in the chair. The subject was introduced by Mr. J. C. Nesbit, and was thus stated in the card—"On the Use and Abuse of Limestone in Agriculture, and the Properties of different kinds of Limestone."

After a few introductory observations from the Chairman,

Mr. Nesbit then said: Mr. Chairman and gentlemen, I feel considerable diffidence in attempting, within one short hour, to bring forward such an important subject as that upon the card. The use of lime in agriculture has, as you are well aware, been known from the remotest ages; and the relations of the different kinds of limestone, the composition of lime and its action in the soil, these are matters upon which a book might be written with much more facility than a lecture could be delivered so as to embrace the leading points. However, as I have only a limited period for introducing the subject, I must do the best I can to bring before you its salient features. Now, in the first place, it may be as well to describe the principal limestones of this kingdom, and to state in what direction they are distributed. We have in England three great divisions of limestone rocks. The first formation to the eastward is the chalk which, beginning at Flamborough Head, in Yorkshire, goes south-westward to Dorsetshire, and, making a

small bend, performs the circuits of Kent, Sussex, Surrey, and Hampshire, stretching from Beachy Head round to Folkestone and Dover. This chalk also dips under the counties of Norfolk, Suffolk and Essex, and part of Kent; and wherever you bore in those counties which lie eastward of the chalk, you come to the chalk again. You have then from the Wash, and extending right through the fens of Cambridgeshire, a soft clay; in fact, the very indentation of the country in that direction is owing to the soft clay intervening between the chalk and oolite. Passing that to the westward of the fens you have the oolite formation, which in its various characters extends from the Yorkshire coast near Scarborough, through Rockingham Forest, in Nottinghamshire, to the Cotswold Hills, and terminates in the sea at Bridport, in Dorsetshire. The oolites contain three varieties of limestone. First, there is what is termed the Portland oolite, found chiefly in the Isle of Portland, but of which a little is found near Aylesbury. Then there is the middle oolite; and there is, farther, the inferior oolite found largely near Bridport. All these oolites furnish very good lime. Besides these, there is the great development of mountain limestone which is found very extensively in Northumberland and Durham, in the eastern parts of Yorkshire, in that part of Derbyshire which is called "The Peak," and in other districts farther to the south. I now come to the next division of limestone, that which is found near Torquay and in certain parts of Exmoor. This is a specimen [exhibiting one] of the kind of lime-stone which is found at Exmoor. This species of lime is not very largely developed in this country; but it exists in two or three places, and, fortunately, just where it is most wanted. We have also in the old red sandstone, or Devonian, the cornstones or nodular masses of limestone, found in Hertfordshire, which make good lime. We have, moreover, the Silurian limestone, which is very much developed in some parts of Wales. This limestone is also found in large quantities near Dudley, and many persons present have perhaps seen the limestone which is called "Dudley limestone." The same limestone is also found in an adjoining county, Shropshire, where it is known under the name of "Wenlock limestone." There is, also, the primitive limestone found in some parts of Devon and Cornwall. Another limestone I should not omit to mention, is the shelly limestone of the wealden formation, found at Bethenden, Kent, Petworth, Sussex, and in the Isle of Purbeck, Dorset. These, then, are the principal divisions of limestone; and let me observe that they are so distributed on the whole, as to leave very few parts of the country without the advantage of being able to obtain a supply within a distance of a dozen or twenty miles. Well, now, having mentioned the distribution of these limestones, I will next proceed to speak of their composition. Limestones have been considered by some persons to be valuable in proportion to their purity; that is to say, in proportion to the absence of anything else but carbonate of lime. You are aware, I presume, that limestone is itself a carbonate of lime. A pure limestone consists of 22 parts of carbonic acid and 28 of lime. When the limestone is heated in the furnace, the carbonic acid is driven off, and pure lime is left behind; that is to say, it would be pure, if the limestone itself were pure. I was remarking that it has been supposed that the purer limestone is the better. Now, I shall endeavour to prove to you that such is not the fact, but that impure limestone—that is to say, limestone containing other substances besides carbonate of lime,—is probably that which is best adapted for agricultural purposes. There are no limestones found perfectly pure; all contain a certain amount of moisture, silica, iron, alumina, phosphate of lime, and even a little sulphate of lime. Now, it is perfectly clear that limestones must be the better for any phosphate of lime which they may contain. As you are continually putting into the soil bones and other substances, because they contain phosphate of lime, it is clear that those limestones which contain the largest proportion of phosphate of lime are the most valuable, supposing the other constituents to be the same. We have analyzed qualitatively in our laboratory some hundreds of specimens of limestones. None were found deficient of phosphate of lime, and probably the average proportion was 1 per cent. Many limestones contain much more than 1 per cent: some contain as much as 3 or 4 per cent.; but, supposing limestones to contain on the average 1 per cent. of phosphate of lime, in that case 10 tons of limestone, or its equivalent of 5 or 6 tons of lime put on the land would furnish 2 cwt. of bone earth per acre, which I need not tell you would be a considerable dressing, and would prove advantageous to the soil for years afterwards. As I said before, it is quite clear that limestones which contain 2, 3, or 4 per cent. are preferable to others which contain only 1 or ¾ per cent. Well, then, many limestones also contain silica in a soluble state, in such a state that when put on the land it is easily acted upon, and, in fact, disintegrated. I think it very likely that a limestone which contains a certain amount of such a substance as silica in a soluble state is preferable to what is called "pure limestone." Many limestones also contain sulphate of lime or gypsum, and even they are better adapted for general use than such as approach nearer to a state of purity. You will thus see, that my opinion upon this part of the subject is, that it is not the purest kinds of limestone, which are calculated to confer the greatest benefit upon the farmer, but that those which contain a certain amount of what are called impurities are the best adapted to agriculture, because they convey to the soil other constituents besides the calcareous matter. Now it would be impossible for me, within the limits to which I am restricted, to give you a distinct idea of the different kinds of lime-stone. Indeed I may remark that the subject has not been sufficiently investigated to enable me to enter into it as fully as I could desire, and it would require much more time than I have had at my disposal to make the necessary analyses. I had intended—and if my lecture had been

postponed for a twelvemonth, I should probably have been in a position—to bring under your notice the results of the analyses of some of the chief lime-stones of the kingdom; but as the task of analyzing would occupy three or four months, you may easily conceive why I have not been able to execute the whole. Speaking of the chalks generally, however, I may say, in the first place, that we have three distinct kinds, the upper and the lower, and the chalk marl, and that they are distinguished by the fact of the lower chalk containing a greater amount of silica and phosphate of lime, and by being more easily acted upon by frost, than the upper chalk. The chalk marl, below the lower chalk, contains a greater amount of phosphate of lime than either of the others, and wherever that is put on the land great benefit is derived from it. The next lime-stone that I shall notice is the weald lime-stone. It is a fresh-water lime-stone; that is to say, the shells which are found in it are fresh-water shells; and it is found at Bethenden, in Kent, at Petworth, in Sussex, and in the Isle of Purbeck, in Dorsetshire. This is a specimen of the lime-stone to which I am now referring [exhibiting the specimen]. It is the kind of lime-stone which was used, during the reign of William Rufus, in laying the foundations of old London Bridge. It contains about 20 per cent. of earthy matter, and when properly burnt into lime it proves very valuable to the land. The next lime-stones are the oolites, well known at Pickering, in Yorkshire, at Northampton, at Higham Ferrers, and in various parts of the country. All these lime-stones contain amidst a quantity of earthy matter ¾ per cent. of phosphate of lime. The next class of lime-stones are the lias, which are found in nodular masses about Whitby and Lyme Regis, and in other parts of the country, and which are generally sent to London to make cement. Below the lias lime-stones we have the mountain lime-stone, which is well seen in Derbyshire, particularly at Crich Cliff. Many of you may have observed a number of lime-kilns, in passing by railway just where you turn off for Matlock. This is an exceedingly good lime-stone, and is sent for miles to be used for agricultural purposes, for which it is found extremely beneficial. Next, there is the lime-stone which is found near Birmingham, at Dudley. That is a lime-stone which has been pushed up by volcanic action and thus it has been intruded into a spot which it would not otherwise have occupied. That, too, is a very good limestone; some parts are very earthy and others very pure; and if I required a supply myself for agricultural purposes, I should certainly not prefer the very purest, although the purest are of course preferred by the iron-masters. We then have the lime-stones of Devonshire, which, generally speaking, are tolerably pure. Well, now, gentlemen, I must speak next of the use of lime; and in doing so, it will be necessary to allude first to the practice of chalking or marling, and also of liming. Now it has been found that the use of marly substances containing calcareous matter is equivalent to the use of lime itself. It does not seem to make much difference, generally, whether you use calcareous matter merely in the state of carbonate of lime, or whether you use chalk disintegrated by frost, or whether you use quicklime itself. There has been a great deal of dispute on this point, but I do not think the experience of farmers has proved that there is much difference in the result between the use of quicklime or of marls, or of soft limestones disintegrated by the action of the air. And I do not see why there should be much difference. If we burn lime, when it absorbs moisture we get it into the state of a very fine powder, a finer one than could ever be produced by mechanical means. This powder, or slaked-lime, absorbs the carbonic acid from the air, and becomes again the same carbonate of lime it was before it was burnt. But, then, its mechanical condition is now entirely changed. Instead of being a hard solid mass, it is a white friable powder. Burning is chiefly useful in the case of hard solid limestones, because by that means they are reduced to a state of powder, and rendered finer probably than they could be by any mechanical means, and in that state they will readily act upon any substance in the soil. Many persons have supposed that caustic lime exerts a great and peculiar action in the soil. I think that is very doubtful. The chief use of burning hard lime-stones is, as it appears to me, that it reduces them to a minute state of division, and that thus they act more readily on the soil. I am not at all singular in this opinion. I believe it is the opinion of nearly all chemists who have examined the question, that lime in its caustic state does not exert any peculiar action, but that it is in the state of carbonate of lime that it exercises a peculiar influence. Well, now, you see we are thus brought to the fact that marling, putting in chalk which is easily disintegrated, and applying burnt limestone, all give the same result. The effect differs only in proportion to the solubility or non-solubility of the lime-stones. If these are very solid, or if the marl containing limestone be not easily acted upon by the air, you will find that those particular substances will not produce so immediate an effect as others which contain the calcareous material in a more soluble state; that is to say, more minutely divided. Well, then, these marls, as I said before, will also differ in their effect, according to the quantity of phosphate of lime or of silica and alumina, and other things of that kind, which they contain. Although carbonate of lime may be the chief material, yet its action will be modified by that of other materials with which it is connected. You see, therefore, that limestones may be regarded in two distinct points of view. First, there is the action of the calcareous matter purely considered, and then there is the action of the materials with which it is connected. Having disposed of the latter part of the subject, so far at least as my limits would permit, let me now proceed to speak of the action of calcareous matter in the soil. Now, lime, whether in the state of caustic lime or of carbonate of lime, has a distinct action upon the mineral ingredients in the soil. In our chemical analysis, if we want to liberate the potash and soda in the soil, we take some of the soil, and

heat it red hot in a crucible, with lime. After this operation we can get all the potash and soda from the soil by the action of water alone. Even if we merely mix a quantity of soil with some lime and water, so as to make a kind of milk of it, and leave it for five or six months; at the end of that time, on filtering the liquid from it, we shall find a considerable amount of alkali dissolved out of the soil. In the same way, when you put a quantity of lime into your soils, and allow the atmosphere to act upon it, the rains dissolve it; it becomes intermixed, and thus acting upon every portion of the soil with which it is in contact, a considerable amount of alkali, which is necessary for the growth of plants, is liberated for that purpose. But lime acts powerfully not only on the mineral, but also on the organic matters in the soil. And this is the great point which I shall have to illustrate to-night, namely, that lime, when used in the soil, acts materially on the organic matters which the soil contains. All good soils contain a considerable amount of vegetable matter, or have the power of absorbing from the air a considerable amount of substances adapted to the formation of organic matter. Now, when you have lime in the soil, whether it is put there in the state of lime or of carbonate of lime, you have at once a determinate action on the organic matters in the soil, and also a greater power of absorption from the air. You have the decomposition of roots and plants and other vegetable *debris* very much augmented by the presence of the carbonate of lime. These substances are not able by themselves to decompose sufficiently rapidly to furnish the greatest amount of nutrition to the growing crop. There can be no quick decomposition, for the simple reason that the substances which would be produced by decomposition would find nothing with which they could unite; but in carbonate of lime you have a substance with which the various vegetable acids formed in the various phases of decomposition can unite at once. Now, it is a fact well known to every gentleman here, that it is on soils which contain a great amount of organic matter, or which have not been under plough for a great many years, that lime produces the greatest effect. If you have worked your land for many years as arable land; if you have ploughed it, and sown it, and reaped crops from it to such an extent as materially to have affected the organic matter of the soil and the stores of ammonia which it has absorbed from the air, lime will do little or no good. But if the case is otherwise, you will find lime produce the very best effects, because it immediately brings the stores of nitrogen and the organic materials in the soil into the best possible state for the action of living plants upon them. I may mention also that the action of lime is very good in peat soils and in soils which contain sulphate of iron, where it is useful in correcting what is called "sourness," a quality which I need not tell you is to be found in many soils. It can scarcely be necessary to tell you that, in order that lime may be useful, the soil must have been previously drained; without that it will be perfectly useless, drainage being necessary to enable lime to percolate through the soil and perform its proper functions. Now there is another action of lime in the soil, which it is necessary to point out. You are well aware of the existence of what is called nitre-beds. You know that in the time of Charles I., of Cromwell, and of Charles II., saltpetre was manufactured in this country in rather a peculiar manner. Patents were granted to persons to go and dig under old stables for the soil they could find there, and to get the mortar from old buildings, &c.; and out of such materials was saltpetre produced. The process was very simple and very effective. Similarly, during the whole course of the French Revolution the saltpetre used by the French army was obtained in the same manner. A quantity of chalk or other calcareous matter was laid up in heaps alternately with farm-yard manure. First there was a quantity of manure, then a layer of mortar or other calcareous matter, then some more manure, and then some more mortar, and so on. All this was watered either with urine or some other liquid. If urine could not be procured, pure water was used. The whole was kept under cover in a tolerable state of moisture, and turned every three or four months. After twelve months no more urine was added, but water only. At the end of eighteen months the whole mass was put into a tank of water and well stirred. The water, after some time, was pumped off; and in it the whole of the ammonia and nitrogen of the manure and the urine were found as nitrate of lime. All the nitrogen of the manure was converted by slow oxidation into nitric acid, which united with the calcareous matter to form a nitrate of lime. This solution was subsequently mixed with wood ashes, which contain carbonate of potash; and by double decomposition there was formed carbonate of lime, which precipitated as a white powder, and nitrate of potash (saltpetre), which was then crystallized. In this way was made nearly the whole of the saltpetre used by Napoleon during his protracted wars. Gentlemen, what took place in these saltpetre beds in France is taking place in your saltpetre beds—your fields. If your fields are properly drained, that they may absorb valuable materials from the air, and if they contain the proper amount of calcareous matter, there cannot be the slightest doubt that the same process will go forward. Beyond this, it is an undoubted fact that more saltpetre is derived from these nitre beds than is equivalent to the nitrogen contained in the manure and urine added to them; that is to say, that the air acts in some way upon these beds, and that there is an absorption of nitrogen by them from the air. In fact, under the influence of the slow decomposition of the vegetable and animal matters in these beds, nitrogen and ammonia are undoubtedly absorbed. Now, if that is the case, if you have a proper amount of calcareous matter in your soils, and a proper amount of organic matter, you will find them not only producing nitre by their own decomposition, but likewise by absorbing similar valuable matter from the air. This absorption will

take place in proportion to the exposure of the soil by means of ploughing, and to the porosity given by efficient draining, harrowing, and so on. Well then, besides, there are one or two points worth mentioning respecting the absorption of ammonia. I do not know whether you are aware that all soils contain a considerable amount of ammonia or nitrogen in some form which is not yet perfectly recognized, but which does not seem distinctly adapted for the use of plants. We have ascertained in our laboratory the amount of nitrogen contained in a number of soils brought from various parts of the kingdom; some of these soils being of the richest descriptions, and others yielding only a rental of from 5s. to 7s. per acre. We have found a very considerable amount of nitrogen in the latter, evidently not available for plants, but in such a state that it might be rendered available. This matter will probably form the subject of a communication to the Royal Agricultural Society, when we have completed the investigation. For the present, I only mention the fact that there is a very large amount of nitrogen in the soil which might be rendered useful; for if you use calcareous matter, you bring this material into distinct action, and make it capable of being taken up and absorbed by the roots of plants. You will see at once, by recalling what I have said, that, if lime acts distinctly upon inorganic matter; and if it acts upon inert organic matter containing nitrogen, in the soil, it is chiefly in the case of those soils which contain organic matters mixed in, and which have not been often ploughed or exposed to the air, that lime will be of material use. You will find that all experience bears this out. If a man has worked his land down to a low state, if he has been taking crop after crop, without much manure, and then fancies that by liming that land he can bring it back to its original state of fertility, he will find himself mistaken. It is upon newly-broken-up land that lime tells best. If, indeed, you go to such a place as Exmoor, where the land has not been turned up within the memory of man, and where the soil contains only just enough lime for a chemist to swear by, you will there find that the use of any other manure is of no avail without lime. You may use guano, you may use bones, you may use what you please of that kind, but not a single crop will you get, unless you also apply lime. In that part of the country you can see every inch of land where lime has been. If you were to take a handful of slaked lime, and inscribe your name on the soil, you would be able to trace, three or four years after, the exact spot where it was marked. I have observed, myself on that moor that in certain parts, where lime had been put, turnips were splendid; but the instant you passed the point up to which the lime had been applied, the crop entirely failed. It is, then, my distinct opinion that the proper application of lime in agriculture is to use it either on such soils as I have mentioned—namely, such as contain a large amount of organic matter—or when using it on arable lands never to trust to it alone, but to use other manures as well, though they ought not to be applied at the same time as quick-lime. There is an old proverb which says—

> "The use of lime without manure
> Will always make the farmer poor,"

—and I think that is a perfectly true saying. There is another action of lime which I wish to refer to. You know, of course, that most limestones contain sulphate of lime. The atmosphere brings down with rain a quantity of carbonate of ammonia, and this carbonate of ammonia being a volatile salt easily evaporates again; but if there be any sulphate of lime in the soil, you find that it does not evaporate, because as soon as ever it comes in contact with the sulphate of lime, the carbonate of ammonia becomes sulphate of ammonia. A change takes place again after the superfluous moisture is evaporated from the soil; for the sulphate of ammonia re-acts on the carbonate of lime, and carbonate of ammonia is again given out. This is a very curious effect. I have here some chalk, and if I add to that some sulphate of ammonia I shall form a portion of sulphate of lime; and carbonate of ammonia will be liberated, and can be easily detected by its odour. When soils are neither too wet nor too dry, but only just moist, carbonate of ammonia was liberated from existing sulphate of ammonia. [Mr. Nesbit here performed an experiment in illustration of the fact.] Well, now there is another point which is of considerable practical importance—namely, that there may be almost a complete absence of lime in soils resting upon limestone. Of course it is well known that heavy clay soils are those upon which lime acts best; but there are no soils on which it is not to some extent necessary. I have found soils resting upon limestone—the Kentish Rag, for example—where there has been limestone within six inches or a foot of the surface, and not the thousandth per cent. of lime per acre in the soil itself. You know it is the constant tendency of lime to descend; and the consequence is, that even soils which were formed by the disintegration of limestone itself as much require liming as any other soils. I know that in Dorsetshire, Wiltshire, and some parts of Hampshire they are absolutely chalking the Chalk Downs with great advantage; and both in those counties and in Kent lime and calcareous matters have, on my recommendation, been applied upon soils resting upon chalk or limestone with very great success. There is another point which I wish to notice, namely, that without the presence of carbonate of lime in the soil you can never have the full action of any description of manure. Suppose you have sulphate of ammonia in the soil, you cannot suppose that it will be taken up into the plant as sulphate of ammonia; the sulphate of ammonia must be decomposed before the ammonia can be absorbed; there is, therefore, something required to unite with the sulphuric acid; this is furnished by the carbonate of lime. You must therefore have carbonate of lime in the soil, and if you have that you will have the sulphate of ammonia giving its ammonia freely to the growing plants. You could not use-

fully apply either guano or any other artificial manure with which I am acquainted, without a proper amount of carbonate of lime in the soil. You see, therefore, gentlemen, that it is necessary to have a certain amount of lime in any soil whatever if you wish to cultivate it to the greatest advantage. Now I will not trespass any further upon your time except to say that the system which Mr. Smith has been lately bringing forward—the old Tullyan system—is dependent upon the principle of exposure of soils to the air. You must have, in this case, a proper amount of lime in the soil, or you can never have that proper absorption of manuring principles from the air upon which this system almost wholly depends. Well, then, gentlemen, I think the conclusions to be drawn from the few observations which I have had the honour to offer to you, are these: that lime can be used beneficially upon soils which have been little stirred, little exposed to the air—upon soils containing organic matter—upon new soils, like those of Exmoor—or upon those which contain naturally or artificially a certain amount of organic matter; but that if used without manure upon arable soils from which crop after crop has been taken, without any manure being added, lime will not restore fertility, and that those farmers who are in the habit of putting large doses of lime upon their land, trusting to that alone for good crops for six or seven years after, are the parties who abuse this most valuable substance (cheers).

Mr. Aitchison said he had had a little experience with regard to the application of lime to soils imbued with weeds; and in such cases it would, he believed, generally prove beneficial. He had also witnessed the good result of applying lime to such land as that of Exmoor; and, on the other hand, he perfectly agreed with Mr. Nesbit that when the soil had been nearly exhausted lime would prove useless. He would like, however, to put a question to Mr. Nesbit with reference to soils which were strongly impregnated with ironstone, or aciduous matter. He wished to know whether he could say from experience how often a dose of lime might be applied to such soils with advantage. He (Mr. Aitchison) was in the habit of applying 120 bushels of lime to the acre, his system being what had been termed by Mr. Nesbit the old Tullyan one. He was living in a country where it was necessary to make a naked fallow for wheat. Once in four years they ploughed the land, and when they had got it into a tolerable state they applied lime in bushel lumps over the soil. The moment the lime was dissolved by the atmosphere, it was applied as hot as possible, and, even to the detriment perhaps of the ploughman and horses, turned into the soil. His impression was, that in a hot or warm state it was more useful to the soil than in its previous condition, being more quickly taken up by the vegetable and fibrous matters in the soil. He could not, therefore, go all along with Mr. Nesbit in saying that chalk itself, applied to the surface of grass lands or otherwise, was as beneficial to the farmer as lime in a hot state. The farmer could not wait five or six years for the result: in these times he wanted to see the result as quickly as possible (Hear, hear).

Mr. Nesbit said the extent to which he would apply lime to soils of the description mentioned by Mr. Aitchison depended much on the nature of the soil itself; it also depended on the character of the limestone, and upon the draining of the soil. He always, however, preferred applying lime in small quantities frequently to applying it in large quantities at long intervals. With calcareous matters it often took two or three years to show the effect; with burnt lime, owing to its finer state of division, the effect was nearly always seen in the first or second year. He did not think there was any great benefit to be derived from the ploughing in of lime in a quick state, because it would in a very little while return to the mild state. There was no proof, he believed, that caustic lime was more beneficial than mild lime. The greater the surface exposed, the greater the action; but, of course, lime did not act until it came into the hydrated state, and after its action it soon returned to the mild state. In general a much smaller quantity of lime would act on the soil than of calcareous matter, owing to its more minute division.

Mr. Ramsey said they must all feel deeply indebted to Mr. Nesbit for his excellent lecture on a subject so interesting to agriculturists. It was scarcely possible for any farmer to compete with that gentleman in chemical knowledge; but there was one point which he had not embraced, namely, that which concerned magnesian limestone. There had been great disputes as to whether the presence of magnesia rendered limestone more valuable or not, and perhaps on that point Mr. Nesbit would be good enough to give them some information. There was another point on which Mr. Nesbit's calculations did not appear quite so close as those of farmers must be. It would appear, from his calculations, that ten tons of lime must be put on the land in order to produce two cwt. of phosphate of lime. Now, that would be a very expensive way of arriving at the benefit. The laying on of ten tons of lime would involve a very serious expense; and if they were not to reap a very large benefit, the result would be anything but satisfactory. With regard to magnesian limestone, he was personally interested in obtaining information, as a good deal of the limestone in his district contained so large a proportion of magnesia that it was actually used for the purpose of making magnesia. Dr. Johnston agreed with Mr. Nesbit that there was scarcely any soil which did not require some liming; and he (Mr. Ramsey) had himself found the benefit of liming, three or four years after the application. Many of the Scotch farmers thought that once in a lease (nineteen years being the ordinary term) was about the proper period for liming. He had always considered this a mistake, and he thought twice in nineteen years was probably nearer the actual requirement (Hear, hear). As to soils which abounded in limestone, he knew land of that description which had been limed every four or five years within his recollection, and that land still derived great benefit from it. Lime, owing to

its gravity, went downwards; and hence farmers who wished to benefit by it could not possibly pay too much attention to deep ploughing and trenching. There could be no doubt that soils containing a large quantity of organic matter would be the first to show the beneficial effects of lime, the question being one of time. If he meant to apply farm-yard manure, he would put on the lime previous to winter, which he believed to be a very excellent way of manuring, for fallow. He would always avoid applying the farm-yard dung at the same time as lime. As to the effect of lime upon old tillage land, he might mention that he was at first disappointed. Professor Johnston, however, being at his house, he happened to express his disappointment to him. In consequence of this, the professor analyzed his soil, and after doing so observed that the soil had been worn out, but that in the course of a year or two he might expect large crops. The result was in accordance with this opinion. This showed the advantage of having scientific men like their friend Mr. Nesbit to consult with. No farmer could be a perfect chemist; but so long as they had such men to guide them, and could place side by side their own experience and the results of scientific investigation, he thought farmers need not despair (Hear, hear). They might expect that, in the end, they would be more scientific than they had ever been yet; that their crops would be better, and their profits larger: they might rest assured that they could not stand still (Hear, hear). He hoped the time was coming when science would make rapid progress, and when they would not be groping in the dark, as they had been for the last half century—he hoped that materials of information would be brought to bear upon agriculture, and they ought to be material ones; for what could be of such material importance as that they should be able to discuss agricultural questions in a clear point of view?

The CHAIRMAN said Essex was a county in which lime and marl, or chalk-marl, was used, perhaps, more extensively than in any other. The large district of Dingey Hundred would be almost useless without calcareous matter, and as it lay near Kent, a supply of such matter was obtained easily. There was an application of sixteen tons to the acre, and the result was, that land which would never do so without that application, had grown wheat, beans, and other crops in abundance for ten or twenty years.

Mr. NESBIT asked whether the substance was chalk or lime?

The CHAIRMAN said it was chalk. It was a singular fact, that the late Mr. John Strutt, though a very intelligent man, had inserted in the leases of his tenants a clause which prohibited marling, under the impression that his land was thus deprived of its fertility: but he lived long enough to be convinced of his error, and to grant leases without the prohibition; the result of which was, that many of his tenants had since grown much larger crops than formerly. Throughout that district in Essex which lay to the north of the eastern counties line, the application of chalk-marl was general. It was a chalk-marl composed of clay and chalk in admixture, and with it were grown the finest barley and a coarse description of wheat. The action of the atmosphere on the soil was equivalent to the use of manure, and they were able to grow four quarters of wheat and five quarters of barley without the assistance of any other manure. To this day they still farmed on the same principle on four furrow-ridges or stetches, with the best results. Lime was now carted to the district in which he lived; he had himself within the last week had some carted a distance of 27 miles, at a cost of £1 7s. 6d. for 100 bushels. That showed what value he attached to it. He, like Mr. Aitchison, had been led to believe that it was desirable to apply lime in the caustic state, and he had many times injured his horses' feet on that account. It now seemed, from what they had heard, that that was quite unnecessary, and this showed, what he had often felt to be the case, that they did not meet there without learning something from each other (Hear, hear). One or two words as to the operation of lime upon grass lands. His grass lands were at first almost useless; red sorrel was produced in abundance, and almost covered the surface. Now, in consequence of the application of lime, red sorrel had almost disappeared, and the crop had become of a different character. The result of liming was not only to bring up what was beneficial, but also to destroy what was injurious. Sour grass, the plant called May wheat, white charlock, and so on, disappeared. He was quite satisfied that the use of lime was not appreciated so much as it ought to be in reference to the improvement of grass lands. He was convinced that nearly all the grass lands thence to Yarmouth might be improved by lime. This was a point to which farmers had not sufficiently attended. Though they applied lime to arable lands, they scarcely ever appeared to think of applying it to pasture lands. He (Mr. Baker) had found it even more beneficial to pasture than to arable lands, and through the proceedings of that club he recommended those who had pasture lands to try the experiment for themselves.

Mr. NESBIT replied. He said he had very little to add to his former remarks. With regard to the magnesian limestone, of which Mr. Ramsey had spoken, they were not in possession of sufficient data at that moment to determine what was the effect of magnesia limestone upon the soil. He had collected lime-stones from some of the largest quarries in England, but he had not yet had time to make analyses. He hoped ultimately to be able to state what was the variation of action between lime-stones containing magnesia and lime-stones which were free from it, in reference to different descriptions of soil. Mr. Ramsey had misunderstood him with respect to the phosphates in limestones; he did not recommend parties who only wished to apply phosphates to land to use lime for that purpose, but recommended them when they wished to apply lime, to use that containing the most phosphates, as the latter would thus be a

clear gain. With respect to the action of lime on grass lands, he had not the smallest doubt that immense benefit would accrue. He had got four or five acres himself, upon which he had been trying experiments. The first thing which he did was to lime that land, having previously ascertained by experiment that it contained little or no lime; the effect was instantaneous, and there was no comparison between the condition of the soil after and before liming.

A MEMBER.—What manure did you apply?

Mr. NESBIT said he applied soap-boiler's waste—10 loads per acre.

Mr. AITCHISON thought the effect must have been to cause the ammonia to fly off.

Mr. NESBIT said his object in liming had reference to the lime and not to the ammonia. As a general rule it must be understood that to put caustic lime with dung was an improper mode of proceeding, whereas to use with dung calcareous matter which was not caustic was a very good mode of proceeding.

On the motion of the Chairman, the following resolution was then adopted—

"That the subject introduced by Mr. Nesbit, the use and abuse of lime in agriculture, as well as upon the properties of various kinds of limestone, is of deep interest, both in a chemical and agricultural point of view, and is therefore also a question of great national importance."

On the motion of the Chairman, seconded by Mr. Ramsey, a vote of thanks was given to Mr. Nesbit for his introduction of the question, and the manner in which he had treated it.

On the motion of Mr. Aitchison, thanks were also voted to the Chairman, which terminated the proceedings.

THE FLAX INDUSTRY OF IRELAND.

Ireland is, perhaps, more particularly identified with the flax industry than with any other department of natural production or of manufacturing enterprise. Its existence has been so cherished, and its progress so anxiously watched and recorded, that its history, which we may date back from the commencement of the past century, is readily traced, and can be told in a few lines. In 1699 we find that an act was passed for the regulation of the linen manufacture, which provided for the appointment of a board in Ireland, to be entitled, "Trustees for Linen and Hempen Manufactures," whose duties were to encourage in every way the proper culture of the flax plant, and to regulate and improve its manufacture into linens, the entire control and direction of the culture and manufacture of flax being vested in them. This board, however, did not assemble for business until October, 1711, when it met under the auspices of the Duke of Ormonde, the Lord-Lieutenant. For the first twenty-five years the funds at its disposal averaged £6,000 a year; subsequently they were increased to £20,000, a sum which was fixed upon by Parliament as the annual grant during the greater part of its existence, which terminated in 1828. Notwithstanding the numerous abuses which the bounty system naturally produced, the Linen Board, through the stimulus which it gave to the manufacture generally, especially by the great increase in the production of the raw material, was productive of much benefit to the nation. At this period (1828) we find the area under cultivation to amount to about 80,000 acres, and little or no further progress was made until 1841, when the necessity for some organized influential body having been acknowledged, a new society was formed at Belfast, under the title of "The Society for the Promotion and Improvement of the Growth of Flax in Ireland," under whose judicious and invigorating auspices flax industry now enjoys a higher state of prosperity and a more healthy development than it has hitherto ever possessed. In 1841, the quantity of land under flax cultivation was 83,745 acres, of which 81,131 acres were in Ulster, and 2,314 acres in the other provinces. In 1851 this had increased to 138,619 acres, of which 123,728 were in Ulster, and 14,891 in other districts. Ulster appears always to have produced the great mass of the raw material, the relative increase in the production of the other provinces being due entirely to the exertions of the society. The principal obstacles to its culture in those districts have been—firstly, the want of scutching-mills for preparing the fibre; and, secondly, the want of local markets for the sale of it. These are being met, to a considerable extent, by the establishment of retteries and scutch-mills by the landed proprietors, assisted by Lord Naas's recent bill, which enables them to borrow the requisite capital from the Government on the same terms as drainage loans; and also by the establishment of flax markets in the larger towns, at which Belfast agents regularly attend. If these advantages are properly met by the growers, the increase in production will no doubt be continued, as both the climate and the soil are well adapted for the plant. Notwithstanding the excellent directions circulated by the Society, the tillage operations often appear to be very carelessly performed, and a practice, still persisted in throughout the country, where the grower steeps his own produce, tends much to obstruct improvement, and also to reduce the amount of the market returns. It is calculated that the produce of at least 100,000 acres of flax was steeped last year without the seed having been taken off, and that the latter, at mere crushing prices, was worth at least £300,000. This practice is the result of ignorance on the part of the farmer, and of a defective industrial system, which

will be speedily changed by the establishment of retteries and scutch-mills, where the farmer will meet with a ready market for his raw produce, without having to attempt any portion of a manufacture for which neither his convenience nor his capacity is generally adapted. He will then be left to his legitimate occupation, that of producing the raw material, for which he will obtain an immediate return, instead of the risk and uncertainty of his present process. This would, to a great extent, resemble the "factorage" system, which works so well in Belgium, and which the Society endeavoured a few years since to introduce into Ireland, but which partially failed, owing to the great difficulty of inducing the farmers to dispose of their flax in a raw state. Because they paid out no money for labour in steeping, they considered the value of their flax straw as equal to what they would have obtained for it in the state of dressed fibre, which left no margin for the factorage and subsequent operations.

The consumption of flax in Ireland has been doubled within the last ten years. In 1841 the spinning-trade numbered 250,000 spindles; in 1851 it was close upon half-a-million. In the place of 16,000 tons, the amount of consumption in 1841, 32,000 tons are now required by the trade. The entire supply of the United Kingdom would at present consume the produce of 500,000 acres, and it is progressively increasing. Our own growth is quite unequal to the demand, and we are consequently forced to rely upon the produce of other countries to furnish the material for one of our most important manufactures, and a manufacture, be it observed, for which the physical character of our own country is peculiarly suitable. The returns of dressed fibre (flax and hemp) imported into this country during the ten years from 1841 to 1851, give an average of about 70,000 tons per annum, which, at £30 per ton, amounts to upwards of £2,000,000 sterling. To this we must add about £1,500,000, the value of 650,000 quarters of linseed, used for seed and for crushing purposes, and about £500,000, the value of 70,000 tons of oilcake, which we annually import, in addition to that made at home for feeding purposes. Thus we are contributing the sum of no less than £4,000,000 annually to the farmers of other countries for an article of produce especially our own, and which on all hands is acknowledged to be, under fair management, a paying crop.

There are several processes for converting the raw material, the flax straw, into the dressed fibre suitable for the spinner; this appears, indeed, to be the department in the flax industry that has received most attention, as upon this point the success of the subsequent operations hinges. It will perhaps render a description of these processes more readily understood if we briefly give the composition of the material from which the fibre is to be obtained. When a portion of flax straw is examined, it is found to consist of three distinct parts: the centre is occupied by a substance composed of cellular tissue, and in appearance like wood; round this is a tubular sheath, composed of bundles of long and tough fibres, cohering firmly together, the whole being cemented together by some azotized compound, and enveloped in a thin and delicate covering or skin. If a piece of the dried straw be rubbed between the fingers, the skin is immediately removed, and the fibrous portions are readily detached from the woody centre. These fibrous portions being composed of bundles of very delicate filaments, may be split up into almost any degree of fineness, according to the process adopted. Now, these various processes differ very much in their mode of separating the fibre from the other portions of the plant. They may be classed under two heads—the "mechanical," or dry preparation, and the "chemical," or wet preparation, by which latter the plant itself is disintegrated, either by the action of fermentation which destroys, or of some solvent which abstracts, the cementing matter by which its various parts were held together. Of the first but little need be said, as, except for rough goods, not requiring to be bleached, as rick-covers, canvas, &c., it could not at present be advantageously used. However, as it costs as much to steep bad straw as good, and the expenses in some cases exceed the value of the produce, it would appear desirable that the dry process should be adopted where the raw material is of very inferior quality, and also in places where there are no opportunities of steeping and scutching the flax by the ordinary method. Several modes have at different times been devised for effecting this mechanical separation. In 1815 the Linen Board expended £6,000 in an endeavour to introduce into Ireland a machine for the purpose, invented by Mr. Lee, a model of which may still be seen in the White Linen-hall, at Belfast; and more recently, those by Donlan, Davey, and others, have been brought before the public. Even in the event of a successful result in the separation, the goods manufactured from the fibre would appear liable to be injured by moisture, or any other condition that would act upon the azotized substance, which would still remain enveloping and cementing the fibres together.

The second, the chemical process, is carried out in several different ways—the principal one, the common "cold-steep," either in pits or streams; the improved method due to Schenck, in which a regulated fermentation, at a high temperature, is maintained in vats by means of steam pipes; the process reintroduced by Claussen, in which the straw is treated with a hot alkaline solution; and, lastly, the *new* and greatly improved method invented by Watt, in which steam is the only agent employed, thus avoiding the noxious influence of fermentation, and the expense, and often injurious effects, of the alkaline solution. In the first two, the body of the straw is disintegrated, the cementing substance being destroyed by putrefactive fermentation; in the two latter, this substance is merely removed by solution in the different menstrua.

The practice of cold steeping in pits or pools is that which is most general in Ireland, each farmer superintending the produce of his own land. The straw, too frequently, with its seed, is carelessly placed in the pit, which is usually about four feet deep and of an oblong shape, care being taken that the whole mass is covered by the water. Here it remains until, upon examination, it is found to have undergone the required change, the

time varying from three to six weeks, being determined by the temperature and quality of the steep-water. Water containing salts of lime or iron is unsuited for the purpose; the process of fermentation is thereby retarded, and the flax acquires a colour which it is difficult to remove. Even under the most favourable circumstances, this is a loose and uncertain practice; much time is occupied, the fermentation is irregular, and the produce is less in quantity and inferior in quality to that obtained by Schenck's process. This was introduced into Ireland in 1848, when its advantages were so obvious that the Society at once recommended it to the notice of those proprietors who were in a position to carry it into operation in their respective districts.

The first rettery on this principle was established in Mayo, in 1848. At the present time there are about twenty at work in the different provinces. In principle it is the same as the preceding, but by using heated water for the steep, the fermenting process is accelerated, and can be controlled according to the quality of the straw or the produce desired. Much time is saved—the three or four weeks of the old process are reduced to three or four days; the fibre is more equal throughout, and is improved in quantity and in quality. In some comparative experiments conducted by the Flax Society into the merits of the two methods of steeping, it resulted that, in *increased yield*, Schenck's gave an advantage of about 20 per cent.; that in *quality*, two samples of Schenck's spun respectively to 70 and 101 lea yarn, while two samples of the same flax, cold-steeped, only spun to 60 and 96 lea yarn; and that in market value, the former gave a return of £10 12s. the acre, against £9 8s., the value of the latter. This process, then, was a great advance upon the old. Time was saved, a better article was produced, and a system of divided manufacture was introduced, which relieved the grower from a duty inconsistent with his vocation, and assured him of a quicker and more certain return for his produce. The principle of fermentation, however, is in itself faulty, as it is quite impossible so to control it as to ensure a perfectly equal action throughout the mass; besides which, the products of decomposition are noxious to those employed, and offensive to the neighbourhood. The plan reintroduced by Claussen, of boiling the straw in an alkaline solution, is free from these objections, and effects the same end by dissolving, instead of decomposing, the cementing substance. The time required, too, is again much lessened, being only from twelve to twenty-four hours. Experience has not yet pronounced upon the value of this method: indeed, with the exception of one or two works upon a small scale, connected with the patent, it has made very little progress, notwithstanding the extraordinary assistance it has had from the public press.

We now come to the last new process, that just patented by Watt, in which steam is the only agent employed, and which, from its extreme simplicity and effectiveness, appears likely to supersede all the others. The whole arrangements are inexpensive, and occupy but little space. The straw is placed in a steam-tight box or chamber, of any size or shape, the top being formed by an iron tank containing cold water, and the lower end having a perforated false bottom fixed at about 12 inches from the other. Steam at a low pressure is blown into the box, and passing up through the straw, comes in contact with the iron top, by which it is condensed; then trickling down through the mass, it passes through the false bottom, carrying with it the extractive matter which it has dissolved out of the straw. This is continued for from eight to twelve hours. The straw is then removed, and is passed through four sets of rollers, which squeeze out about eighty per cent. of the water, and at the same time crush the stems, breaking up the central woody substance, and materially assisting its subsequent separation from the flax fibre. From these rollers it is carried to the drying-house, which is heated by steam-pipes from the boiler, and thence to the scutching-frames, where the operation is performed more rapidly and efficiently than when the flax is prepared by steeping, owing to the thoroughly crushed state in which it comes from the rollers.

The flax is then ready for market, having passed through the whole process of conversion in a very short space of time. This important improvement upon the other processes is now just being carried out by Messrs. Leadbetter, of Belfast, who have erected the necessary buildings for carrying it out on an extensive scale. From the work that has already been done, it is shown that the entire operation may be completed in twenty-four hours; that on the average, 1 ton of straw will produce 2½ cwt. of dressed flax, and that the condensed liquor from the steaming-chest contains matter of a nutritious nature, having, according to analysis, a feeding value equal to distillery wash. This may be advantageously used by being poured, while hot, over the broken capsules or seed bolls, which contain in themselves much nutritious matter, and in this state are readily eaten by cattle or pigs. The flax produced has already been sold at high prices, and has been pronounced by spinners to be of apparently unexceptionable quality.

A preliminary meeting in reference to this invention has been held by the Flax Society, and a large committee, composed of its members and of others interested in the trade, has been appointed for the purpose of instituting "a careful and extensive series of experiments, with a view to compare it both in a practical and financial point of view with the modes of hot and cold steeping generally practised." At present it would appear to possess the following advantages:—

1. Great saving of time.

2. Economy of fibre, owing to the facilities with which it is separated from the "shove," or woody centre, in the scutch-mill, thereby producing little waste in scutching tow, which latter is only worth from 6s. to 10s. per cwt., while the long fibre from which it is torn away is worth from 50s. to 100s. per cwt.

3. Avoidance of any nuisance. Instead of the offensive products of the steep, an inodorous liquid is obtained, which may at once be consumed advantageously for feeding purposes.

4. The encouragement it will offer for the extension of flax cultivation throughout the country, by affording an opportunity to those who desire it of organizing at a

small outlay an establishment which will always insure a ready market for the produce of the district.

Much good has already been done in this respect by the introduction into several districts of retteries on Schenck's system, those in operation purchasing directly from the farmer and steeping upwards of 30,000 tons in the course of the year. The new process, however, being able to complete the operation in a quarter the time required by the other, would, of course, be able to turn out four times as much work in a given time; and, as the arrangements would be less expensive in outlay, it offers an advantageous opportunity to all friends of Irish industry who wish to encourage the home cultivation of flax, and to retain in the country a portion, at least, of that large sum which is annually expended in purchasing the necessary supplies from foreign countries.

Having already given a sketch of the production of the raw material, and of the various modes of preparing it for the manufacturer, we will first briefly consider the changes it undergoes in his hands, in order to render it suitable to the various requirements of the market; and, secondly, the part it occupies, when manufactured, in the general commerce of the country. These changes consist of three distinct operations—spinning, weaving, and bleaching, in each of which great and important advances have of late years been made.

Up to a late period in the past century all the yarns were produced by handspinning, which was carried on in farmhouses and cottages throughout the country. These yarns were brought into the nearest town on market-days, when they were purchased either by the weavers or by agents, who supplied them to other persons; or in many cases the female members of a family spun the yarn, which was woven by the men. In 1795 the first machinery for spinning flax was erected in England, and, as it was speedily proved that yarns could be thus produced both better and cheaper than by hand, it was soon extended. At this time the flax was spun dry, and only coarse yarns produced. In Ireland we find that the first spinning factory was established at Cork in 1805, and consisted of only 212 spindles, adapted for canvass yarns. The Linen Board, by a bounty of 30s. per spindle, succeeded in causing the establishment of several others, which in 1809, in the aggregate, contained 6,369 spindles. In 1815 there were in Ulster five mills, the largest having 1,204 and the smallest 300 spindles; in Leinster two mills, and in Munster seven: only one of which was in full operation, owing to the depression of trade at that period.

The necessity, however, of increasing these spinning machines was shown in 1825, when English and Scotch machine-spun yarns began to be imported into Ireland, and completely undersold the handspun product. These yarns were produced by an improved system termed "wet spinning," the fibre, during the process of twisting, being passed through hot water. By this mode (invented by Kaye, of Manchester) it could be spun much finer, and by degrees, aided by continuing improvements, the quality and fineness of the yarn were so much changed, and the economy of labour so much attended to, that the handspun yarns were completely superseded, except for fine cambrics. The first factory of any magnitude on this improved system was established in Ireland in 1828, others soon adopted it, and new ones sprang up. In 1841 we find there were 41 mills, containing 260,000 spindles; in 1850 the number had increased to 73 mills, with 339,000 spindles; and in 1852 there are no less than 81 mills, having about 500,000 spindles in operation, representing an amount of capital invested in buildings, machinery, and in the necessary commercial operations, of between three and four millions sterling. About two-thirds of the mills are situate at Belfast and its vicinity, which, being the centre of the linen trade, and possessing great advantages in respect to the supply of skilled labour and cheapness of fuel, is considered preferable as a locality to the more rural districts. As the employment of machinery for spinning increased, the linen manufacture appeared gradually to withdraw from the south and west, and to concentrate itself in the north, where the spinning factories were principally situate. With the exception of Drogheda, and, to a small extent, Cork and Mayo, scarcely any linens are now made beyond the boundaries of Ulster. To form a correct estimate of the development of the industry in Ireland, we have only to compare it with its condition in England and other countries. In England the last report gives the number of spindles at 265,568, and in Scotland at 303,125, giving, with Ireland, a total for the United Kingdom of 1,068,693. In France we find the number of spindles to be about 250,000, the factories being situate chiefly in the departments Du Nord, Calvados, Finisterre, and Pas de Calais. In Belgium there are about 100,000 spindles in operation, the factories being at Ghent, Malines, Brussels, Liege, and Tournai.

Holland possesses only one factory, of about 6,000 spindles, in Friesland. In Switzerland there are three or four small establishments, working from 8,000 to 10,000 spindles in all. Russia has two large factories, one at Alexandrofsky, and the other at Moscow, together numbering about 50,000 spindles. Spain has two or three, containing say 6,000 spindles. Austria possesses eight factories, with about 30,000 spindles in operation. In the States of the Zollverein about 80,000 are estimated to be in use; and in the United States we find twelve small factories, situate in the States of New York, Pennsylvania, Massachusetts, and New Jersey, and numbering between them 14,550 spindles. Now, reckoning the average cost of buildings, machinery, and motive power at £4 10s. per spindle throughout, it would appear that there is altogether a *fixed capital* of £8,000,000 invested in this trade, of which sum nearly £5,000,000 belongs to the United Kingdom. Notwithstanding these large returns of machinery for spinning in operation both at home and abroad, we find that the hand-spun yarn very far exceeds it in quantity, since throughout the continent hand-spinning is still carried on to an enormous extent.

The arrangements of the large spinning mills are very complete, and well repay a visit. In the capacious stores may be seen samples of flax of various qualities, the produce of various countries, and varying in price

from £25 per ton for Egyptian to £140 per ton for Belgian and French. The manufacture is commenced by a process termed "heckling," which is done in the first part by hand, and afterwards by machinery. This separates the long and perfect fibres from the faulty, which are either used up in coarse yarns or sold as a "sorters' tow." A loss is sustained in the first part of from 4lb. to 18lbs. the cwt., according to the quality of the flax, the Irish hand-scutched giving the greatest, and the Belgian and French the least. In the heckling by the machine, where fine combs are employed, an additional loss ensues, averaging 6lb. per cwt. It is then fit for spinning. The banding, spreading, drawing, and roving machines are very similar in construction to those used in cotton mills, with the exception that in the last part of the operation the yarn is passed through a bath of hot water, which softens the fibres and enables a much finer yarn to be rove from them. The yarns are reeled off the bobbins into hanks, and then tied up in bundles, ready for sale. Where fine yarns are spun, the quantity of flax worked up is about 25 tons per 1,000 spindles per annum; for coarse linen yarns the quantity varies from 30 to 50 tons per 1,000 spindles. The power required to drive the machinery is estimated at about six-horse power for every 500 spindles. This is a much higher power than that required in cotton mills, where 500 spindles may be driven by a one-horse power. The greater number of mills spin the medium qualities only—in some the finer numbers, 200's to 250's, are produced. For these the choicest samples of flax are chosen, the manipulation is more careful, and the machinery more delicate, than with the coarser yarns. In these, too, the increased value which labour gives is more prominently shown by the difference between the price of the raw material and the manufactured article. For instance, a bundle of 240 lea yarns weighs 9lb. 14 oz.; its selling price is £8; while the *maximum* value of the material itself, the flax, could not exceed 20s., showing the relation between the values of the raw and of the manufactured article to be as 1 to 8. In the coarse yarns this great increase is no longer perceptible. A bundle of 40 lea yarns weighs 30lb., and sells for 24s. 9d., the value of the raw material being about 15s., or, in relation to the manufactured, at 1 to 1.6.

The yarns spun in Irish mills are in general medium numbers, suitable for both coarse and fine linens; the numbers suitable for cambrics, lawns, &c., are chiefly the production of the English mills, and the very coarse yarns for canvas, bagging, and other rough goods, are those generally spun in Scotland. Besides yarn-spinning, a large and increasing trade is done in twisting sewing-threads, which, either as brown, bleached, or dyed, command an extensive sale in Great Britain and on the continent. One kind of bleached thread, made by a peculiar process to resemble silk, has lately been sold largely to the Nottingham lacemakers.

The employment of machinery in spinning flax may be considered as the salvation of the Irish linen trade. Had Ireland continued to maintain hand-spinning it would have been impossible for her to contend with other manufacturing countries in the great markets of the world. The comparative cheapness of mill-spun yarns, and their superiority in the production of an even and uniform fabric, form the basis of the present condition of the linen trade. Formerly it was impossible for the linen merchant to assort his parcels properly, from the great variety of yarns employed in the manufacture, and from their unevenness of quality. Now, large parcels of linen can be made to order to any degree of fineness, heavy or light, as may be required. The manufacturer buys his yarns in quantities of the spinner, and gives them out to his weavers, so that when he receives the linens from them they are as nearly as possible of the same quality and appearance; they bleach regularly, and when exported are always the same as the sample.

Linens are no longer sold to any extent in the open market by individual weavers. A new system has arisen. There are now manufacturers, many of whom employ from 100 to 2,000 and 3,000 weavers, and who purchase the yarn in quantities, boil it, wind it, and give it out to be woven, receiving the webs on certain appointed days, and paying the weaver for his labour by the piece. There are, however, some extensive firms who are at the same time both spinners and manufacturers, who send their linen to the bleacher, and receive it from him when finished; after which they have it lapped and ornamented, and either export it direct or sell it for home consumption. These houses make a variety of fabrics, in which they are guided by the demand in the respective markets. As in the case of most other manufactures, certain districts excel in the production of different kinds of fabrics. Thus, the neighbourhood of Lurgan is the seat of the cambric and lawn manufacture, Lisburn and Belfast of damasks, Armagh of light linens, Ballymena of heavy goods, and so on.

The substitution of machinery for hand labour in weaving is a natural consequence of its successful application in the spinning process. In England and Scotland the manufacturers have eagerly availed themselves of its manifest advantages. In Ireland a power-loom is, as yet, rarely to be seen, so difficult is it, under ordinary circumstances, to introduce a change in the established practices of a craft. If we turn to the Factory Inspectors' report for 1850 we see, to our astonishment, that in England there were 1,131 power-looms at work, and that in Scotland there were 2,529, while in Ireland the entire number amounted only to 58. But the linen districts in Ireland are now affected by *more than ordinary* circumstances, and it is no longer possible to disguise the fact that they cannot meet the present requirements of the market, either in quantity or in price. The two most important causes affecting them are "emigration" and "cheap food." The Ulster weavers have chiefly been small farmers, cottiers, or labourers. At seed time and at harvest they were in the fields; during the other parts of the year they were at their looms. The farmers were enabled to obtain their subsistence from their potato crop, a portion of which they ate, while the remainder fed their pigs or was sold in exchange for other necessaries. Their rents were not paid by their produce—that all went to their subsistence—but by the money earned at their looms, which also met their wants for

clothing, tea, and other cheap luxuries. The potato blight annihilated the small farms, and their occupiers shoaled off to the western world. The cottiers and labourers are left still; but, between the wages they earn from farm-labour and from their looms, they can now, by working only four or five days in the week, live as well as they used to do in the old days of "Protection," when they were forced to work hard the whole week. From these two causes it results, firstly, there are fewer weavers now than there were in 1846; and, secondly, those that remain turn out fewer webs.

Since 1846, however, the demand for Irish linens has progressively increased both in the home and foreign markets; consequently the demand increases in a progressive ratio over the power of supply, while, at the same time, the competition for hands has increased the cost of labour, which, in respect to cheapness of production, places Ireland at a great disadvantage when she has to meet the Belgian and German in those foreign markets where she had gradually supplanted them. In fact, it appears that within these last few months Belgian goods are competing successfully with Irish in some of the South American markets. This condition of the Irish linen trade demands the immediate and serious consideration of every one connected with it. Every day is of importance, as a retrograde movement has commenced, and must be arrested at once. Two points must be gained—an increase in the quantity and a decrease in the cost of production. The first might to a certain extent be obtained by the employment of additional hand-looms in other districts; but the south and the west are not equal to the wants of the north. Both might be obtained by the use of *power-looms*. England and Scotland have already shown how advantageously they can be used for coarse goods. Surely Ireland, with such a future threatening her staple manufacture, will produce men with both the energy to attempt and the skill to overcome any little mechanical difficulties that may occur in adapting them for finer goods. In Glasgow, indeed, this has recently been accomplished; thus, while the practicability of the process for Ireland is proved, another and a vigorous rival will take possession of the field.

Before the linen is ready for market the greater portion of it has to undergo the process of bleaching, the sale of brown or unbleached goods having considerably diminished of late years. This process constitutes quite a separate department in the trade, the bleacher in most cases having the goods from the manufacturer, and returning them again to him when finished and ready for sale. In this department great advances have been made during the present century. Formerly "buttermilk" was supposed to possess peculiar bleaching properties, the lactic acid it contained being probably the active agent; consequently, a large herd of cows was a necessary appendage to a bleach-green. In 1764 Dr. Ferguson, of Belfast, received from the Linen Board a premium of £300 for the successful application of lime in the process; in 1770 he introduced the use of sulphuric acid; in 1778 potash was first used, and in 1795 chloride of lime was first practically applied. In those days the bleach-greens were more numerous than they are now, notwithstanding the immense increase in the linen trade. Improved processes and a better application of labour enable the bleacher of the present day to turn out nearly ten times the amount of work he could do fifty years ago. The process is commenced by steeping the goods in hot water to dissolve the dressing, and then followed by boiling them in a weak alkaline ley for a certain time. They are then washed in rather a primitive and somewhat expensive manner, after which they undergo a scrubbing process with soap and water, and are then washed again, and carried to the green to be grassed. Here they remain spread out and exposed to the weather so many days, according to the description of the goods. They are then taken in for the last part of the operation—the chloride process, which requires both care and skill in its application. Chloride of soda is used in preference to chloride of lime, the goods being afterwards immersed in a weak solution of sulphuric acid, and again thoroughly washed. The drying is usually done in heated chambers, whence the goods are taken to the beetling-machines. This operation is the last, and nothing remains but to fold them up into their proper forms, press them, and then they are ready for market. Some very beautiful chemical principles are involved in the bleaching process—the alkali in the boiling solution combines with the greater part of the organic colouring matter of the linen, which is dissolved in the boiler or in the subsequent washing; the bleaching effect of exposure on the grass to the action of light has long been known, though the cause was until recently but little understood: and the successful application of chlorine belongs quite to the scientific bleacher of the present day. Not only is the operation more perfect, but an important saving in time is effected by the present system, the entire process averaging now from four to six weeks, instead of the six months of the old system. Indeed, the time now is often determined by the market requirements; in the case of an urgent demand, goods have not unfrequently been returned by the bleacher in a week or ten days.

Some of the bleachworks in Antrim are on an extensive scale, and are conducted with great skill, giving employment to a large number of hands. Near Lisburn the two firms, Messrs. Richardson, employ about 300 hands each, and in the course of the year bleach goods having a market value in the aggregate of about £1,200,000 sterling. The improvements in the spinning and in the bleaching processes have been followed by a great reduction in the price of the manufactured goods, the sale of which has enormously increased. The relative prices of yard-wide linen in 1805 and 1850 were as follows:—

	14°°	18°°	20°°	22°°	24°°
	s. d.	s. d.	s. d.	s. d.	s. d.
1805 ..	2 0 ..	3 4 ..	4 4 ..	5 11 ..	10 6
1850 ..	1 2 ..	1 8 ..	2 1 ..	2 6 ..	3 6

being about 45,000,000 yards in 1805, and 110,000,000 in 1850. This increase is due chiefly to the export trade; the home consumption, not being so much affected by reduction in price, has not increased in the same pro-

portion. One cause probably for this is the immense progress of the cotton manufactures after the employment of machinery in spinning cotton wool, which caused a corresponding increase in the home consumption of its fabrics many years before the linen manufacture in its turn participated in the same facilities of production; hence cotton rapidly increased in consumption among the lower classes of the United Kingdom, while linens continued to be worn only by the better classes. The export trade has steadily increased for a series of years. Under the Linen Board bounties were paid on the export of several kinds of fabrics, the last having ceased only in 1830. Although these bounties in the earlier period of the manufacture tended to encourage an export trade, the true source of its late increase has been in the improvement in the spinning and general manufacture, which permitted a gradual reduction in price, and thus supplanted the Belgian, German, and French manufacturers in neutral markets. At one period the supply of South America and the West Indies was chiefly in the hands of the Germans, but the Irish trade advanced so much more rapidly, owing to various improvements, that German linens almost entirely disappeared, and the Irish, until quite recently, commanded the market. One kind of Irish linen largely sold in South America is termed "Silesias," and is made up in imitation of the goods formerly supplied by that province in Germany. The New World takes the great mass of linen exported, those sent to the eastern hemisphere being of very trifling amount in comparison.

From returns recently published we find that 39,000,000 of persons in America consume annually more than two yards of our linens per head, while 228,000,000 in Europe take but one thirty-eighth part of a yard per head. This difference does not arise so much from the consumption being proportionably less in the countries of the Old World as from the high duties which most of the European States maintain on the import of these fabrics, and from the small disposition to use them in Asia and Africa, where cotton fabrics are almost exclusively used. It is more than probable that a reduction of price on linen may ultimately increase its consumption in the East. Already the exports to the Levant have been considerably augmented.

The gross returns of the quantities, and of the declared value of linen manufactures and yarns exported from the United Kingdom during the past year, are very satisfactory. Of woven goods there were 128,780,362 yards, having a value of £3,827,443. The thread, tapes, and small wares were valued at £285,333, and of linen yarns there were 18,518,273lb., amounting in value to £935,939, forming a total of £5,048,615 sterling. The Board of Trade returns for the month ending Sept. 5 give an equally satisfactory account of the present state of the trade, the exports for the month showing an increase over those of the past year of £46,625.

Without question, this prospering condition of the trade is attributable to general improvement in manufacturing, and to the consequent reduction in price, which has enabled our manufacturers to compete so successfully with those of other countries. In such a trade progress is essential to vitality. A refusal, or even a hesitation on the part of a manufacturer to adopt an improved process, even at the sacrifice of his old notions, often gives the start to an opponent which costs him years to recover. Disastrous as this is between individuals, it involves far weightier considerations when the competition is between countries. The Irish portion of the linen trade appears just now to be in a critical state, —her means of supply are not equal to the demand; and already we find that foreign countries have re-entered the lists with her in her most prized markets. Two causes have principally effected this. These causes remain, and become more powerful every day, But cannot they be met? and, if so, why this hesitation? The power-loom dreads not emigration; it flourishes upon "cheap food." The substitution of machinery for hand-labour in the spinning process has long since shown the immense benefits it has conferred on the trade. The requirements of the market, no less than the present peculiar condition of Ireland, call urgently for its application to the loom.—Times.

SOME CROPS THAT MIGHT BE CULTIVATED IN GREAT BRITAIN WHICH ARE NOT COMMONLY CULTIVATED.

Whoever recommends the agriculturists of this country to cultivate a new crop, incurs a great responsibility; and if his recommendation is attended by success, he receives great credit. We are neither presumptuous enough to venture upon the former, nor have we sufficient ambition to aim at the latter. Our object here is merely to enumerate certain crops that are grown on a large scale in other countries, but which are not cultivated by our farmers, or concerning which there appears to be sufficient evidence to warrant the possibility, at least, of their successful introduction.

Mangold-wurzel is in England now extensively cultivated for the purpose of feeding cattle. It is not much grown in Scotland, as turnips are found here to afford in general a greater amount of food per acre. On the continent it is grown for the sake of extracting sugar from it; and, did the law permit it, it might be profitably grown for this purpose in this country, and also for making beer and ale.

From the official documents of the French Government, we learn that the usual average of a beet crop is about 10½ tons an acre. Each cwt. yields 4¾ lb. of sugar; and, accordingly, the produce per acre would be nearly half a ton of sugar. Boussingault found that, to manage an English

acre of land under beet-root, 45½ days of a man and 14 days of a horse was the amount of labour expended.

The expense of obtaining the sugar from the beet is, however, very great. The roots are washed and rasped, and then subjected to strong pressure; the juice is boiled, filtered through animal charcoal, and boiled until it is sufficiently reduced. But owing to the improvements made in the machinery, the cost of separating the sugar has been very much lessened; and it is now affirmed that a farmer here might grow beet and separate the sugar, leaving himself a profit, and yet sell the sugar at 2½d. per lb.

Beet-root may be substituted for malt in brewing; and supposing the above calculation to be correct, it is probable that a gallon of beet-root beer, of the strength of ordinary table beer, could be made for about 2d. Did the law allow it, and were it considered advisable, a spirit might be distilled from this.

In making sugar from beet, the residue is employed for feeding cattle.

Tobacco is forbidden to be grown in Britain by the excise laws. Indeed, tobacco of the finest quality cannot be produced in this climate; and tobacco grown in Europe, or even Virginia, cannot be compared with that of the Havannah and Varinas. Still, the plant does succeed in this country, and tobacco of ordinary quality might be grown here. About 12 cwt. per acre is a common crop; and more could probably, by good farming, be attained. It would therefore appear that tobacco would be a profitable crop.

Tea is an article for which there is an immense demand, and which, from its passing through so many hands, and its long transit, sells at a price that would doubtless very handsomely remunerate the producer of it in this country, provided it were possible to produce it. And there seems reason to believe that the green-tea plant might be acclimatised. Perhaps the best plan would be to procure seed from the north of China and Japan, in which place, we believe, the cold of winter is more intense than here. Certainly, if the tea plant could stand our winters, it would be a very profitable crop. Each plant produces about 2 lb. of tea annually; and the plants are planted from 3 to 6 feet apart. When it is considered that tea sells for nearly 3s. a lb., the money return per acre (supposing these statements are correct) seems enormous. The expense of preparing the tea for the market does not seem to be great. It is hand-picked, and (in Brazil) immediately dried. "From 4 to 6 lb. are thrown into an iron pot, the interior of which is polished, and which may be somewhat more than 3 feet in diameter, by about a foot in depth. The temperature of the pot is maintained at about the boiling-point of water. A negro stirs the leaves in all directions with his hands until they become quite soft and pliant, so that they can be moulded into pellets by movement between the hands. When the leaves are in this state they are thrown upon a tray made of bamboo, and strongly kneaded for a quarter of an hour, so as to force out a green sap of a disagreeable taste." They are then returned to the pot and dried.

Chicory is a plant that might probably be introduced into extensive cultivation. The powder of its ground root was originally used as an adulteration amongst coffee; but now the public have acquired a taste for the mixture, and prefer it to pure coffee. It is now openly and avowedly sold. It is found that a crop of from 12 to 15 tons can be obtained to the acre. The roots are sliced and kiln-dried, and the above weight is then found to be reduced to about 1 ton. This sells at from £15 to £23. The cost of labour, kiln-drying, &c., is about £5 a ton. Consequently for rent, manure, and profit, there is left a margin of from £10 to £18.

Oil-producing plants.—The rape is the only plant commonly cultivated by the British farmer on account of its oil. On the continent several other plants are grown for this purpose, two or three of which might perhaps be advantageously introduced. The following table, quoted from Boussingault, shows the results of some experiments made by M. Gauzac of Dagny.

Crop.	Seed produced per acre.	Oil obtained per acre in lbs. avoirdupois.	Oil per cent.	Cake per. cent
Winter crops—	cwt. qrs. lb.			
Colewort	19 0 15	875.4	40	54
Rocket	15 1 3	320.8	18	73
Rape	16 2 18	641.6	33	62
Swedish turnips	15 1 25	595.8	33	62
Curled colewort	16 2 18	641.6	33	62
Turnip cabbage	13 3 19	565.4	33	61
Spring crops—				
Gold of pleasure	17 1 16	545.8	27	72
Sunflower	15 3 14	275.0	15	80
Flax	15 1 25	385.0	22	69
White poppy .	10 1 18	560.8	46	52
Hemp	7 3 21	229.0	25	70
Summer rape ..	11 3 17	412.5	30	65

We do not know what plants he means by coleworts and turnip cabbage, but two of the plants mentioned in the above list, the gold of pleasure and the white poppy, and another oil-bearing plant, the Madia sativa, have perhaps a claim upon the consideration of the British agriculturist.

The gold of pleasure, or the Camelina sativa of

botanists, is a native of Britain; but whether it is indigenous, or has been accidentally introduced from the continent along with flax, is doubtful. At any rate, although a much esteemed cultivated plant of many other countries, it has never received much attention in Britain; and yet it is not easy to discover the reason of this. The gold of pleasure produces an oil for burning, which is considered to have less smoke and smell, and scarcely any of the latter, with a brighter flame, than that obtained from the rapes. It yields a large quantity of oil to the acre, does well upon light soils, and occupies the ground for a short period, coming to maturity in the south of Europe twice in the season. Even here it may arrive at maturity in time for sowing grass seeds after it. Besides affording oil, the gold of pleasure yields a fibre which does for thatching, sack-making, &c.

The white poppy is cultivated for the sake of its milky juice, which in its crude form affords us opium, and for the sake of the oil of its seeds. This oil is in this country mainly used for some purpose of the painter, but in many parts of the continent it is very extensively employed as a substitute for butter. Very little English opium is made, but about 40,000 lb. are annually imported from Turkey, Constantinople, &c. This quantity, if grown at home, would require about seven hundred acres. The following is an account of the produce obtained from an acre of poppies. We have retained the value of the oil and oilcake, but they are greatly over-estimated.

56 lb. of opium, at 36s.	£100	16	0
250 lb. of cold drawn oil, at 1s. 6d...	18	15	0
125 lb. of warm do., at 6d.	3	2	6
500 oil-cakes, at 18s. per 100	4	10	0
Total.....	£127	3	6

The procuring of the opium, however, must be an expensive process. When the capsules are half grown, incisions are made into them, care being taken that the interior is not penetrated into. A white substance immediately flows out, which is collected by old women and children, by means of knives covered over with sealing-wax. This juice is scraped off into and stored up in jars. The seeds are not injured by this process, but come to maturity and have the oil extracted from them in the usual manner.

The poppy, in addition to its opium, extracts from the ground a larger quantity of oil than a cow can do. The average quantity of butter that a cow can produce, may perhaps be set down at 300 lb. per annum, and she will require an acre and a half of ground; whereas, in the experiment we have quoted, the poppy from that area yielded more than 370 lbs. of oil. Still, for vegetable oils for culinary purposes, there is little taste in this country; and the demand for opium will, of course, always be limited. Hence we can scarcely expect to see any very extended culture of the poppy in this country.

The Madia sativa is the remaining plant of this group that seems to demand at least a modified attention in this country. It is sufficiently hardy, and would appear to be productive. Boussingault, now a dozen of years ago, planted it long with carrots in a well-dunged field. The crop took one hundred and twenty-seven days to come to maturity, and the following was the result:—

Seeds, husks deducted.....	2424 lb.
Dried leaves used as litter	7700 „
Carrots without their leaves	31966 „
The seed gave—	
Of oil.....	635 lb.
Of cake	17067 „
And 100 parts of the seed gave—	
Of oil.....	26.24 lb.
Of cake	70.72 „
Of loss	33.04 „
	100.

It is a curious fact, and illustrative of the imperfect manner in which the oil is separated from the seeds, that while the common pressman only obtained some 26¼ per cent., Boussingault, in his laboratory, from the same seeds actually procured 41 per cent. When the oil-cakes are meant for feeding, this loss is of little consequence, inasmuch as the oil serves a very good purpose; but when the cake is only intended to be used as a manure, it is a great loss, inasmuch as the oil is of little or no use in adding any food for crops to the soil.

There is a great lack of plants in this country cultivated for the sake of the *tannin* that they contain. As our readers are aware, the basis of the skin of animals is composed of a substance to which the name of gelatine is given. One of the properties of this substance is, that when combined with tannin it forms the compound of tannate of gelatine, or leather—a substance which is so useful to mankind. From time immemorial the substance employed to furnish the tannin to the hides of animals, in order to convert them into leather, has been oak bark. But as the purpose for which oaks are grown is their timber, and not their bark, the supply of oak bark cannot be calculated upon, and this is perhaps one of the causes why tanning as an art is in such a backward state. Could a plant abounding in the principle of tannin be grown on our fields, there can be little doubt but that it would be remunerative. Perhaps we possess or might possess such in—

The sumach, a species of which is the agent employed by the Turks in tanning. There does not

seem to be any reason to believe that the common sumach would not be hardly enough for the climate of this country. Some other members of the genus might probably also come to sufficient maturity here.

It is possible, also, that we possess indigenous wild plants that contain a good deal of tannin, and which might perhaps be successfully cultivated.

There are two or three plants that might probably be advantageously cultivated in this country, for the sake of their *fibre*, besides flax and hemp. Perhaps the most important of these, ridiculous as the assertion seems, might be the *nettle*. At any rate, its claims have never been sufficiently considered. We leave the nettle, however, to its insignificance, and pass on to the enumeration of two plants that, were there a demand for cheap wine in this country, might perhaps be profitably grown in Britain, and their juice converted into wine. In order, however, to have clear ideas upon this point, it is perhaps necessary to recal to our memory the exact composition of wine.

Wine essentially consists in a mixture of alcohol that has been produced by the fermentation of sugar, of tartaric acid, a peculiar ether, and, perhaps, other flavouring substances, the whole diluted with at least seventy-five per cent. of water. Sugar is contained in a great many vegetable productions, and only differs in chemical composition from alcohol in each equivalent of it containing one atom more of carbon and two of oxygen. If we extract these last mentioned atoms from sugar, we have at once alcohol; and we produce this change artificially, by what is called the process of fermentation. In order that this process of fermentation shall take place, the sugar must be dissolved in water, the solution must be placed in a certain temperature, and to it a substance called ferment must be added. Two of the commonest of our ferments are gluten and yeast. When to a solution of sugar and water either of these is added, an intoxicating drink is produced. Then malt contains a large quantity of sugar; and if this be dissolved in water, and fermented by having yeast added to it, we have ale or beer. In like manner apples contain sugar, water, and gluten; and when apple juice is placed in a proper temperature, it ferments and forms cider. Wine, however, is not only an alcoholic drink obtained from the action of a ferment converting sugar into alcohol, but its alcohol and water essentially contain tartaric acid, ether, &c.

The grape contains water, sugar, gluten, and tartaric acid, and hence its juice ferments, and is changed into a mixture of water, alcohol, and tartaric acid, and, by keeping, the formation of an ether is eventually brought about. Hence, in all ages, the fermented juice of the grape has been considered the type of wine; and the great consumption of it in this country, notwithstanding its high price, shows how very much a necessary of life it has become. Formerly, in the south of England, vineyards were common. It has been conjectured that their management was only known to the monks, and that they fell out of cultivation after the Reformation, because the farmers were ignorant of the proper culture of the plant. One or two, however, lingered on until our fathers' times, and we know that the wine that they produced resembled claret. Provided that they would pay, there is nothing, to our certain knowledge, to prevent the production of good wholesome wine in the south of England.

The expense of management in a vineyard is doubtless great, and we have not any data just now before us by which we could estimate it. The produce of one is more easily ascertained, and the following table indicates the wine obtained per acre from a vineyard in Flanders, in about the latitude of London, for 13 years. It was planted in 1822, and began to yield in 3 years.

Years.	Wine per acre in gallons.	Years.	Wine per acre in gallons.
1825	68.75	.... 1832	209.9
1826	192.0	.... 1833	311.6
1827	0.0	.... 1834	413.4
1828	115.0	.... 1835 ...	620.0
1829	55.9	.... 1836	544.5
1830	0.0	.... 1837	184.4
1831	153.0		

The average quantity, per acre, of wine obtained yearly from this vineyard, is 224½ gallons, or 110 dozens. If the average of the last six years, however, when the vines had got fairly established, be taken, it would be considerably higher.

The vine, however, is a very uncertain crop. Unless it receive the exact amount of heat and light that it likes, it does not form a sufficient quantity of sugar; and the wine that is made from it is, of course, deficient in alcohol. The French, who are the best wine-makers in the world, have, however, found a remedy for this; and now, when the juice of the grape is deficient in sugar, they add as much sugar to it as will make up the deficiency; —and in this manner they secure the same strength of their wine each year, and are in a great measure independent of season. And by the aid of this fact, not only might a vintage be secured in the south of England each year, but wine might perhaps be made farther north then even was the case before.

There is a great deal of incredulity, first, upon the possibility of making wine at all in this country; and, secondly, upon the possibility of making good sound wine from unripe, or partially unripe, grapes.

Besides the statement that wine used to be annually made in England, we may, regarding the first point, quote the experience of Mr. Hamilton, who made champagne upon his property in England. "Many good judges of wine," he says, "thought it superior to the best champagne they ever drank, even the Duke de Mirepoix preferred it to any other wine; but such is the prejudice of most people to anything of English growth, that I generally found it prudent not to declare where it grew till after they had passed their verdict upon it. The surest proof that I can give of its excellence is that I sold it to wine merchants for 50 guineas a hogshead; and one wine merchant to whom I sold £500 worth at one time, assured me that he sold some of the best of it at 7s. 6d. to 10s. 6d. per bottle."

Upon the second point, we will state the authority of Dr. Macculloch. "It has been fully proved," he writes, "that a compound of an artificial *must* can be fabricated from due mixture of sugar with the extractive matter and saline substances of fruits capable of undergoing a regular fermentation, and of forming good and perfect wine. Long ago, experiments were made in France, by several chemists, with green grapes and sugar, with complete success. I have repeated these experiments, and varied them, with the best effects. The produce is varied with the management, and the result of the trials has been wine resembling champagne, Grave, Rhenish, and Moselle; and of qualities so perfect, that the best judges and wine-tasters have not been able to distinguish them from foreign wines. The grapes may be used in any state, however immature."

One pound of sugar fermented affords as much alcohol as makes two bottles of a wine of the strength of champagne.

Considering all the above facts, and, moreover, the possibility, which we here leave out of the question, of other vegetable productions affording wine, there is a probability that the time may come when the British farmer, like the French one, will grow upon a part of his farm something that will be converted into wine.

Madder is a plant that can perhaps be grown to greater perfection in this country than anywhere else. We doubt, however, if it is grown at all; and yet it would appear to be a profitable crop. In Alsace it is propagated by using the sprouts that it throws out in spring, and which very readily strike. The soil is heavily manured and trenched, and the planting takes place in May. The roots are not ready for gathering until the second November following, and the crop is estimated to average about 3300 lb. per acre. This is equivalent to an annual crop of 1650 lb., or nearly 15 cwt. The price of madder fluctuates; but it is often, we fancy, £3 a cwt.

A number of *leguminous* plants might be cultivated in this country for the sake of their ripe seeds. The following table, copied from Schwertz, indicates the produce per acre, and the weight of a bushel of haricots, lentils, and vetches :—

	Weight of bushel in lb.	Produce per acre in bushels.	Weight of dry straw per acre.
Haricots	47.5	66.7	Not stated
Lentils	62.3	39.8	Do.
Vetches	62.3	41.2	2 tons 4 cwt. 2 qrs. 11 lb.

The Transactions of the Highland and Agricultural Society for July, 1852, contain an essay on the cultivation of lentils, by M. Guillerez.

A still more valuable suggestion was recently made by Professor Voelcker, in his paper, in our pages, upon *Quinoa*. If, as seems very probable, this plant could ripen its seeds at a high elevation above the sea, many of our uncultivated mountains, now scarcely worth anything, might afford a due supply of grain.

Not only is the introduction of a new crop a source of direct profit to the farmer, but its good influence often extends further than this, and greatly improves agriculture. As instances of the truth of this, we may cite the introduction of clover and turnips.—Journal of Agriculture.

AGRICULTURAL EXPERIMENTS.

Amongst the class of experimenters there is none so valuable as those which aim at settling principles in cultivation. It is useful—it is often very valuable — to possess experiments with a particular manure on a certain soil; but he who, like Lawes or Boussingault, or Henneberg or Polstorff, tries experiments with a view to settle the very grounds of action of all manures, goes far beyond all this, and lays the foundation broad and deep for a vast succession of future successful efforts in the cultivation of the soil. Mr. Lawes began by sowing the land with corn, without any manure, till he arrived at a production which he considered the natural growth of the soil. Starting with this as soil, he made a series of most valuable experiments.

Polstorff and Henneberg arrived at the same result by a different, and, perhaps, on the whole, less exceptionable means; for if Lawes' experiments

would be more satisfactory to practical minds, theirs would be more so to scientific. Lawes commenced with natural soil itself, as it was denuded of manure by corn-growing, and so perhaps much better resembled the generality of soils for the good of which he laboured. Polstorff, however, adopted a different course. He compounded soils with known materials, and experimented upon these, and so his deductions were, perhaps, on the whole, much more abstract, though they may not have so much weight with cultivators, being less modified by circumstances of subsoil, climate, natural mechanical mixture, &c. Polstorff arrived at the following conclusions from a series of experiments made in artificial soil in boxes, which he communicated to the Agricultural Society of the Duchy of Brunswick, viz. :—

"1. A soil which is endowed with the most appropriate and most superior physical properties for the cultivation of plants, yields no crops when limited to these alone.

"2. A soil which is free from all organic substances yields the highest return, provided it possesses the appropriate physical qualities, and contains, in a suitable form, the necessary mineral constituents of plants."

Now, these practical and experimental deductions seem somewhat in keeping with the theoretical opinions of Liebig. He made out that decaying vegetable matter had no favourable influence in producing a crop of barley, and in one set of experiments more produce was obtained from a soil destitute of humus than from one to which a certain proportion was added.

Dr. Henneberg repeated the experiments to a certain extent, and the result we shall give below. The artificial soil was made to represent the chemical constituents of the ashes of barley, and consisted, in parts, by measure, as follows :—

White bole, 1 part by weight
White chalk, 2 parts „ } 1 part by measure.
Wood charcoal ..... 1½ „ „
White sand ..... 3 „ „
1¼ lbs. of dry decayed vegetable matter burnt, and the ashes added.
1½ lbs. of feldspar and burnt lime, heated to redness, and pounded.

This was the soil. Then different manures were added, which are called A, B, and C. They were a mixture of—6 parts of bone-ash, and one each of calcined soda, burnt magnesia, burnt gypsum, and common salt, and differed merely in their mode of mixture or combination, not very materially altering their operation. They were thus applied—

Box No. 1.—Manured with burnt vegetable matter.
„ „ 2.—Burnt feldspar, burnt vegetable matter, and the manure.
„ „ 3, 4, 5.—With the manure alone.
„ „ 6, 7, and 8.—The manure and about 350 lbs. of sal ammoniac.

At germination, after the whole were sown with barley, the box No. 1 had the greatest development, and appeared the most vigorous, while the boxes 6, 7, and 8 had a colour of a far darker green. The box No. 1 continued to grow in a thriving and uniform state, while some of the others grew unequally and slowly; and though some misfortunes attended the experiment, it was as carefully collected as possible, and the following are the proportions of corn :—

No. 1.....	672	No. 5.....	519
„ 2	166	„ 6.....	553
„ 3	565	„ 7.....	699
„ 4.....	297	„ 8.....	898

Now, though there is somewhat of complexity in the results, as might perhaps be expected in all the imitations of soil, which must be bungling as compared with the operations of nature, we must say we lean to the combination of mineral and organic manures.

For although No. 1 stands somewhat high as regards No. 6, yet if we take the average results of 6, 7, and 8, we shall find it absolutely inferior.

And if No. 2 be vastly inferior to both, it becomes a question what kind of manure the vegetable matter consisted of? We will venture to say, that if an ammoniacal mixture were added to this formula, we should have had the largest return.

We well remember a practical case in point. An incendiary reduced a pile of barley-stacks, representing some twelve or fifteen acres of barley, to ashes. The whole of these were scattered over the land adjoining the stacks, covering some half-an-acre: the straw and corn were therefore all, as regards mineral constituents, left on that small quantity of land. We have watched a turnip crop, a *barley* crop, and a crop of seeds since that period, and there has been no perceptible superiority in any one of them over the rest of the field, nor have the crops either in that or any other part of the field been extraordinary.

We do not know a more complete refutation of the mineral theory than this.—Gardeners' and Farmers' Journal.

THE AGRICULTURAL DISTRICTS OF ENGLAND.

[FROM THE TIMES' COMMISSIONER.]

DECEMBER 17.

Having now traversed 32 of the 40 counties of England, it is time that our mission should draw to a close, the many facts already collected forming a sufficient basis for an accurate estimate of the present condition of agriculture in this country. Since Arthur Young's tours in 1770-1, there has been no similar inquiry, the agricultural reports of counties collected by the Board of Agriculture, and those at present being published by the Royal Agricultural Society, being the work of separate individuals, full of instructive information, but wanting the link of combination and comparison which is obtained from the single point of view whence one mind surveys in succession the various modes of husbandry practised throughout England.

An interval of 80 years affords ample room for denoting with precision the progress of agriculture. Young's *Six Months' Tour* concludes with very specific data, showing the actual state of rents, produce, prices, and wages in 1770-1, in the 28 counties which he then examined. The information on which his data are based seems to have been the same as ours—personal inquiries from the most trustworthy sources. As regards rent and produce, it is obvious that, unless the same farms had been spoken of, exactness of comparison is impossible. The figures which we gave are therefore not offered as perfectly correct, but as the nearest approximation to correctness in our power. Until Government shall take up the important question of agricultural statistics, we must be content with such broad results as it is in the power of individual inquiry to elicit, conscious though we may feel of the comparatively limited data from which we are obliged to generalise.

	s.	d.	
In 28 counties of England the average rent of arable land, in 1770, appears from Young's returns to have been	13	4	an acre.
For the same counties our returns* in 1850-51 gave an average of	26	10	„
Increase of rent in 80 years	13	6	or 100 per cent.

	Bushels.	
In 1770 the average produce of wheat was	23	an acre.
In 1850-51, in the same counties, it was	26¾	„
Increased produce of wheat per acre	3¾	or 14 per cent.

	s.	d.	
In 1770 the labourers' wages averaged	7	3	a-week.
In 1850-51, in the same counties, they averaged	9	7	„
Increase in wages of agricultural labourers	2	4	or 34 per cent.

	Bread. d.	Butter. s.	d.	Meat. d.	
In 1770 the price of provisions was	1½	0	6	3½	per lb.
In 1850-51 it was	1¼	1	0	5	„

In 1770 the price of wool was		5½d. per lb.
In 1850-51 it was		1s. „

In 1770 the rent of labourers' cottages averaged 36s. 10d. a-year; in 1850-1, in the same counties, 76s.

It thus appears that, in a period of 80 years, the average rent of arable land has risen 100 per cent., the average price of wheat per acre has increased 14 per cent., the labourers' wages 34 per cent., and their cottage rents 100 per cent.; while the price of bread, the great staple of the food of the English labourer, is about the same as it was in 1770. The price of butter has increased 100 per cent., meat about 70 per cent., and wool upwards of 100 per cent.

The increase of 14 per cent. on the average yield of wheat per acre does not indicate the total increased produce. The extent of land in cultivation in 1770 was, without doubt, much less than it is now; and the produce given then was the average of a higher quality of land—the best having, of course, been earliest taken into cultivation. The increase of acreable corn produce has therefore been obtained by better farming, notwithstanding the contrary influence arising from inferior soils. The increased breadth now under wheat, with the higher average produce, bears, however, no proportion to the increase of rent in the same period; and the price of wheat now is much the same as it was then. We must, therefore, look to the returns from stock to explain this discrepancy.

While corn has not increased in price, butter, meat, and wool have nearly doubled in value. The quantity produced has also greatly increased, the same land now carrying larger cows, cattle which arrive at earlier maturity and of greater size, and sheep of better weight and quality and yielding more wool. On dairy farms, and on such as are adapted for the rearing and feeding of stock, especially of sheep stock, the value of the annual produce has kept pace with the increase of rent. With the corn farms the case is very different. In former times the strong clay lands were looked upon as

* These returns will be found in detail in the collected letters now passing through the press, and to be published by Messrs. Longman.

the true wheat soils of the country. They paid the highest rent, the heaviest tithe, and employed the greatest number of labourers. But modern improvements have entirely changed their position. The extension of green crops, and the feeding of stock, have so raised the productive quality of the light lands, that they now produce corn at less cost than the clays, with the further important advantage, that the stock maintained on them yields a large profit besides. In all parts of the country, accordingly, we have found the farmers of strong clays suffering the most severely under the recent depression of prices.

The rent of land is defined by Mr. M'Culloch to be "the result of the unequal returns of the capital successively employed in agriculture." But in practice we have found rent to be a very capricious thing, often more regulated by the character of the landlord or his agent and the custom of the neighbourhood than by the value of the soil or the commodities it produces. There is not a county in England where this is not exemplified. On one estate we shall find land let at 20s. per acre, and on the next farm, of the same quality and with the same facilities of conveyance, let at 30s. With farmers of equal skill and enterprise this difference of rent remains in the pocket of the fortunate tenant who holds under an easy landlord. But exertion is generally the child of necessity, and the man who must pay 30s. is obliged to be industrious, while his neighbour may be indolent, and, in that case, the difference of rent is lost to all, because indolence leads to diminished production. The active and industrious man employs more labour to raise an increased produce, that he may be enabled to pay his higher rent.

While, however, we deprecate the underletting of land as injurious to the landlord, and frequently in its consequences to the public, we must guard against an error of the opposite character, which is much more hurtful—the over-letting of land. When the rent of land is raised to such a point that the profits of the farmer's industry are absorbed by it, he loses the motive for exertion, and, if a man of capital, he carries it, on the first opportunity, to a farm where it can be more profitably employed. In other cases he may struggle on, in hope of success, till his capital is so seriously diminished that he has little to withdraw, his farm all the while rapidly deteriorating in cultivation and produce till it is at length abandoned to the landlord.

It may be very difficult to hit the happy mean between these extremes, and, if there was no extraneous element to influence the result, that mean would probably be best regulated by supply and demand. But the preference over other creditors given to the landlord by the law of distraint is sometimes used to encourage competition between men of capital and skill, and men who have little of either, and the rent may thus be unfairly raised. Competition in the open market, therefore, is not always, in the present state of the law, the fair measure of the value of land to the tenant of capital.

Three remarkable examples of the different results produced by the mode of letting land have been detailed in these letters. In Oxfordshire we have found a great landlord so injudiciously requiring an increase of rent that his best tenants have left and a large portion of the estate is being abandoned to him. We have described the relations between another nobleman and his tenants in Durham, where neither the rent is raised nor the tenants changed, where the bulk of the land is confessed to be underlet, and yet the tenants are not prosperous nor satisfied. In these two cases we have the opposite extremes, producing in the one case ruin and diminished produce, and in the other, indolence and discontent. How nearly alike is the result of conduct dictated by principles so different!

The third example is shown in Bedfordshire, where another landlord, fully recognizing his duty, puts his farms into a proper state as regards the permanent improvements necessary for their profitable occupation, and then lets them on lease to selected tenants, at a fair rent, estimated by his agent, who is practically acquainted with the value of land. Undue competition is thus discouraged, while at the same time the landlord participates, by gradually improving rents, in the increasing wealth of the country. The tenants have their capital left free for the cultivation of the land, in the full benefit of which they have the option of being secured by lease. A living sympathetic interest is thus maintained between landlord and tenant, the result of which is seen in improving farming, increased employment, and a cordial understanding between a wise and considerate landlord and an intelligent and independent tenantry. On many other estates mentioned in these letters the same principles are followed by similar results.

The influence of proximity to large populations in enhancing the rent of land varies in different parts of the country. The lowest rented counties in England are Surrey, Sussex, and Durham, two of which may be said to be in the vicinity of the metropolis, and the third has a large and well employed native population. The highest rented counties are Lancashire and the West Riding, many parts of which are continuous villages, and both contain a large proportion of grass land. In 1770, distance from the metropolis seems to have in a great measure regulated the rent, which begins, according to Young, at 19s. 6d. an acre in Berkshire, and gradually falls to 7s. 6d. in Cumberland. But the means of communication in his time are described by him as "execrable." "Let me most seriously caution all travellers," he says, "who may accidentally purpose to travel this terrible country, to avoid it. They will here meet with ruts which I actually measured four feet deep, and floating with mud only from a wet summer. I would advise no one to journey further north than Newcastle-under-Lyne. Until better management is produced I would advise all travellers to consider this country as sea, and as soon think of driving into the ocean as venturing into such detestable roads." Matters are changed now. We have railways traversing every part of the country, steam vessels sailing from almost every port, and generally good houses of accommodation between every village and market town.

Rent, in so far as regulated by external circumstances, we shall find depends now on other influences than proximity to or distance from the metropolis. To illustrate this, among other points,

we have prepared the following table, which divides the country into two sections from north to south, with reference to climate, the one embracing the eastern and south coast, or corn side of the island, the other the midland and western counties, where the system of husbandry is more a mixture of corn, stock, and dairy farming.

Table, showing the Average Rent of Cultivated Land, the produce of Wheat in bushels, and the weekly wages of the Labourer in 1850-1, in the Midland and Western Counties, being the mixed Corn and Grass Districts; and in the East and South Coast Counties, being the chief Corn-producing Districts of England.

Midland and Western Counties.	Per Acre. Rent.		Per Acre. Produce	Labourers' Wages.	
	s.	d.	bush.	s.	d.
Cumberland	25	0	27	13	0
Lancashire	42	0	28	13	6
West Riding	40	0	30	14	0
Cheshire	30	0	28	12	0
Derby	26	0	33	11	0
Nottingham	32	6	32	10	0
Leicester	35	0	21	9	6
Stafford	30	0	28	9	6
Warwick	32	6	30	8	6
Northampton	30	0	28	10	0
Buckinghamshire	26	0	25	8	6
Oxford	30	0	25	9	0
Glocester	28	0	23	7	0
North Wilts	35	0	28	7	6
Devon	30	0	20	8	6
Averages	31	4	27	10	1

East and South Coast Counties.	Per Acre. Rent.		Per Acre. Produce.	Labourers' Wages.	
	s.	d.	bush.	s.	d.
Northumberland	20	0	32	11	0
Durham	17	0	16	11	0
North Riding	29	0	20	11	0
East Riding	22	6	30	12	0
Lincoln	30	0	26	10	0
Norfolk	25	6	32	8	6
Suffolk	24	0	32	7	0
Huntingdon	26	6	32	8	6
Cambridge	28	0	32	7	6
Bedford	25	0	25	9	0
Hertford	22	6	22	9	0
Essex	26	0	28	8	0
Surrey	18	6	22	9	6
Sussex	19	0	22	10	6
Berks	30	0	30	7	6
Hants	25	0	30	9	0
South Wilts	17	6	24	7	0
Dorset	20	0	21	7	6
Averages	23	8	26½	9	1

Average rent of cultivated land in all the counties 27s. 2d.
Average produce per acre of wheat ..... 26¾ bushels.
Average weekly wages of labourers ..... 9s. 6d.

The great corn-growing counties of the east coast are thus shown to yield an average rent of 23s. 8d. an acre; the more mixed husbandry of the midland counties, and the grazing green crop and dairy districts of the west, 31s. 4d. This striking difference, being not less than 30 per cent., is explained chiefly by the different value of their staple produce, as already shown; corn, the staple of the east coast, selling at the same price it did 80 years ago, while dairy produce, meat, and wool, have nearly doubled in value. The difference in rent does not arise from a greater fertility of soil, as may be seen by comparing the produce of wheat. The corn counties, in so far as they yield barley, and feed, or produce cattle and sheep, benefit by the rise in price.*

Leases are the exception throughout England; and though we have found them more prevalent in the west, there has been no sufficient uniformity to account in any degree for the difference of rent.

But the size of farms has an undoubted influence on the rent. In the dry climate of the counties of the east coast, the operations of a corn farm can be carried on, with great precision and regularity, on an extensive scale. In the chalk districts especially, the fields are open and unincumbered with wood; the dry nature of the land admits of sheep folding, and a large tract may be conveniently managed under the superintendence of one person. By this means the landlord's outlay in buildings and fences is much economised, and he finds it his interest to encourage a class of large farmers, men of capital and education. As we proceed westward, the country becomes more wooded and better adapted for pasturage; the enclosures are smaller, the farms less extensive, and the farmers more numerous. Still further west the moistness of the climate

* The table is so far incomplete that our information in regard to the different "rates" payable by the tenant in addition to his rent shows them to be so variable that no accurate average could be given. Some farms were tithe-free, and on others the landlords are now taking upon themselves the payment of tithe. In some parishes the poor-rates were trifling, in others exorbitant; and the same with highway rate and other county rates. A table (to be given in a succeeding letter) shows that the poor-rates are, on the average, nearly equal in their pressure in both sections of the country. And on the whole, though the tithe appears to be heaviest on the south and eastern counties, the rates, in the aggregate, may be held to be nearly alike in both divisions of the country, and will not affect the truth of the averages we have given. We have a strong feeling that landlords would find it a good plan to take upon themselves the payment of all rates except the poor-rate, letting their land, as in Scotland, at a certain rent, free of all other rates. The landlords, who in effect, pay all the rates in diminished rent, would then have a direct interest in controlling and economising the county expenditure, for which they are both best qualified and have most time, and the tenants would know the exact extent of their engagements, and not be obliged, as at present, to reserve a wide margin for these uncertain liabilities.

materially affects the mode of cultivation, unfavourable to corn crops, especially before the introduction of tile drainage, and favourable to grass. The farms are of small extent, and held by a numerous class of tenants, who live frugally, and, in many cases, assist with their families, in the labours of the farm. We have here all the elements necessary to make a difference in the rate of rent. The chief commodity of the western farmer is the produce of his dairy, his cattle, and his flock. The large eastern farmer looks principally to his wheat and barley. It will thus be seen that the landlord of the western and midland counties possesses the two great advantages of his soil being used for the production of our most valuable agricultural commodities, while his farms, from their size, are accessible to a larger body of competitors—in short, are in greater demand than the corn farms of the east. Our notes of the average extent of farms in the various counties give 430 acres for the corn farms of the east, and 220 acres for the mixed farms of the midland and western districts.

The geological character of the country has a considerable influence on its intrinsic value, in so far as it affects the character of the soil itself. In all the lower-rented counties, except the three northern-most, chalk is the prevailing characteristic. In the high-rented counties red sandstone is the principal geological formation.

An attentive consideration of the above table will strike the careful reader in several new points of view. That the large capitalist farmer of the east coast, possessing the most cheaply cultivated soil, and conducting his agricultural operations with the most skill, should not only pay the lowest rent, but be the loudest complainer under the recent depression of prices, is to be accounted for by his greater dependence on the value of corn. The moistness of the climate of the west, on the other hand, discouraged corn cultivation, and compelled a greater reliance on stock; and as the country becomes more prosperous, the difference in the relative value of corn and stock will gradually be increased.

The production of vegetables and fresh meat, hay for forage, and pasture for dairy cattle, which were formerly confined to the neighbourhood of towns, will necessarily extend as the towns become more numerous and more populous. The facilities of communication must increase this tendency. Our insular position, with a limited territory, and an increasingly dense manufacturing population, is yearly extending the circle within which the production of fresh food, animal, vegetable, and forage, will be needed for the daily and weekly supply of the inhabitants and their cattle, and which, both on account of its bulk and the necessity of having it fresh, cannot be brought from distant countries. Fresh meat, milk, butter, vegetables, and hay, are articles of this description. They can be produced in no country so well as our own, both climate and soil being remarkably suited to them. Wool has likewise increased in value as much as any agricultural product; and there is a good prospect of flax becoming an article in extensive demand, and therefore worthy of the farmer's attention. The manufacture of sugar from beetroot may yet be found very profitable to the English agriculturist, and ought not to be excluded from consideration.* Now, all these products require the employment of considerable labour, very minute care, skill, and attention, and a larger available application of capital than is requisite for the production of corn. So various are the objects thus requiring attention and economical arrangement that a very large undertaking, such as is now carried on by some of the wealthier farmers of the eastern counties, could not, on this more elaborate system, be profitably conducted under the single superintendence of one person. This will inevitably lead to the gradual diminution of the largest farms, and to the concentration of the capital and attention of the farmer on a smaller space.

The individual experience of the agricultural class may be appealed to in support of this opinion. The consumption of bread in a farmer's family is not half so large an item in the annual expenditure of his household as butchers' meat; and milk and vegetables and beer, if they were purchased in the market, would cost him more than bread. If he looks back for 30 years he will find that this difference has been gradually increasing. With the great mass of consumers bread still forms the chief article of consumption; but in the manufacturing districts, where wages are good, the use of butchers' meat and cheese is enormously on the increase; and even in the agricultural districts the labourer does now occasionally indulge himself in a meat dinner or season his dry bread with a morsel of cheese. In a gentleman's family, consisting of himself, his wife, six children, and 10 servants, the average expenditure for each individual per annum for articles of food produced by the farmer was £9 10s. for meat, butter, and milk, and £1 2s. 4d. for bread. In a large public establishment, containing an average throughout the year of 646 male persons, chiefly boys, the expenditure per head for meet, cheese, pototaes, butter, and milk is £4 10s. 6d., and for bread £2 1s. 6d. The price of each article is charged in both cases at the present average rates throughout England. The first example shows an expenditure in articles the produce

* There are two important considerations with regard to the culture of flax and sugar beet. The farmer may not only receive a remunerative price for the fibre of the one and the saccharine matter of the other, but he retains on his farm the seed of the flax and the refuse of the sugar manufacture to feed his stock and increase the quality and quantity of their manure. The uses of linseed, as food for cattle, are well known in this country; and, in regard to the refuse of the beetroot manufacture, we may mention (on the information of the Comte de Gourcy, who has devoted several years to the personal investigation of continental agriculture) that very large stocks of cattle are fed on the sugar farms, and that a machine has been lately invented by a sugar manufacturer at Baden, which, like our thrashing machine, can be introduced at about the same expense on individual farms, and by which the sugar can be extracted from the beet and prepared for commerce at a price of 2½d. a pound, after paying the cost of manufacture and a remunerative value to the farmer for his beet.

of grass and green crops nearly nine times as great as in corn; and the second, which may be regarded as more of an average example, also shows an outlay 2¼ times greater on the former articles of produce than the latter. Here we see not only the kind of produce most in demand, but the direction in which household expenditure increases when the means are ample. It is reasonable to conclude that the great mass of the consumers, as their circumstances improve, will follow the same rule. And in further illustration of this argument it may be mentioned that the only species of corn which has risen materially in price since 1770 is barley, and that is accounted for by the increasing use of beer, which is more a luxury than a necessary of life.

Every intelligent farmer ought to keep this steadily in view. Let him produce as much as he can of the articles which have shown a gradual tendency to increase in value. The farms which 80 years ago yielded £100 in meat and wool, or in butter, would now produce £200, although neither the breed of stock nor the capabilities of the land had been improved. Those which yielded £100 in wheat then, would yield no more now, even if the productive power of the land had undergone no diminution by a long course of exhaustion. The clays of Durham and Cleveland, and the wealds of Surrey, Sussex, and Kent are in this state of reduced fertility. The wheat they produce brings the same price per bushel as it did 80 years ago, but the quantity each acre yields is diminished. The tenants of these and similar districts are the poorest of their class in England, and the rent of the landlords has scarcely increased. In Cheshire and Lancashire there are clays as stiff and infertile; but even if they produced no more than they did 80 years ago, their owners and tenants have increased in wealth, inasmuch as that produce of cheese and butter, the staple of their district, which then sold for £100, is now worth £200. But the acreable produce itself has likewise increased, and this is a most important feature in the case; for a large stock of well fed animals every year adds fertility to the land on which they are kept, while a constant succession of corn crops, not yielding a corresponding return of manure, gradually diminishes that natural fertility. The consequence of this, and likewise an illustration of our argument, is that at present corn land in the wealds of Surrey or Sussex may be hired at 15s. or bought for £21 an acre, while grass land of much the same quality in Cheshire lets at 30s. and sells at £45 an acre. Nay, even in the same county the contrast is more striking; for in Surrey a meadow lets at £3 an acre, while tillage land, originally of the same quality, on the opposite side of the fence, shall scarcely fetch 15s.

While we thus attempt to indicate the direction in which experience seems to have shown that agricultural enterprise will for the future be most remunerative, it is proper to advert to the possible effects of such a change on the supply of food and the demand for labour. If more land should thereby be gradually laid to grass, or a greater extent be devoted to the production of meat and vegetables, we should expect, as the result of better cultivation, that there would be little or no diminution in the annual produce of corn, inasmuch as the smaller extent would yield a larger acreable return. But, although that increased return should be found insufficient to compensate in quantity for the diminished breadth of corn crops, no anxiety need therefore be felt for the bread of the people. Rest from corn cropping is the best preparation for the future growth of corn; and if an emergency should ever arise by which, in consequence of war, we should be driven back on our own resources, we would find that we had been laying up in our rich grass fields, and well manured green crop lands, a store of fertility which might be called into action in a single season, and which would yield ample crops of corn for consecutive years, with little labour or expense.

Experience also shows that this change of husbandry would not prove injurious to the labourer. Green crops require more manual labour than corn. And even an increase of grass, combined with green crops, would probably not diminish the demand for labour. It is in the strictly corn districts of the south and east that the labourer's condition is most depressed. The dairy lands of North Wilts, the vale of Gloucester, and the vale of Aylesbury afford better wages to the labourer than the corn districts of the same counties, Salisbury plain, the Cotswolds, and the corn farms on the Chiltern hills.

THE EFFECTS OF THE NEW GOLD FIELDS ON AGRICULTURE.

Though the gold of California and Australia is not likely to cause any greater rise of prices than that which took place during the seventeenth and eighteenth centuries—that rise being spread over the next fifty years—it is by no means improbable that it may raise the price of silver. Silver underwent a depreciation of fifty per cent. with respect to gold, after the discovery of the mines of Potosi. Before that event, the value of gold to silver varied between 9 to 1 and 11 to 1. That is to say, 1 lb. of gold, which previously exchanged for a quantity of silver varying with the relative abundance of the two metals between 9 lbs. and 11 lbs., exchanged, when the silver mines of the New World came into activity, for 15 lbs. of silver. Gold has never yet effected a revolution in prices. It was silver, not gold, which produced that of the sixteenth century. Eager as the Spaniards were for gold, and though they stripped the natives of all that they had collected during centuries, it was insignificant in quantity, and insufficient to affect prices. The gold of Hispaniola, which furnished the chief supply, was exhausted in twenty years. The old relations between gold and silver may be restored should the present yield of gold continue for many years, unless a corresponding addition shall be made to the supply of silver. As yet, scarcely any appreciable alteration has taken place in the price of that metal. Some are of

opinion that the produce of silver is increasing. Wyld's estimate on this point is as follows:—

1840..	Gold..	5,000,000	..	Silver	6,750,000
1848	,, ..	7,000,000	..	,,	6,750,000
1850..	,, ..	17,000,000	..	,,	7,500,000
1851..	,, ..	22,500,000	..	,,	7,500,000

A greater increase in the produce of silver is by no means improbable, for successful mining operations in one quarter stimulate to increased exertions in others. Silver is much more abundantly diffused in nature than gold. There is scarcely any lead ore in which it is not present. While it could only be separated by the process of capellation, which destroyed a large portion of the lead, it was unprofitable to extract the silver from any but those of ores of lead which were rich in it. Pattinson's ingenious process, founded on the different temperatures at which melted lead and silver crystallise, removes this objection, and enables the poorest silver-lead ores to be unsilvered. The silver mines of America, which produced such remarkable effects in the sixteenth century, and have since yielded, till lately, the greater portion of the precious metals, are remarkable, not for the richness of their ore, but for its abundance, and the facility with which it can be wrought. Most of the American silver ores are too poor to pay for smelting, and recourse to amalgamation with mercury therefore becomes necessary. The abundance or scarcity of mercury consequently exercises a great influence on their produce. Next to cobalt, this is the rarest of metals. The chief supplies are derived from two mines —that of Almaden in Spain, and that of Huancavelica in America. The discovery of new mines of quicksilver would therefore increase the silver produce of Mexico and Peru, and would contribute to preserve the existing relations between gold and silver. If, therefore, the mine of New Almaden, in California, shall reduce the price of quicksilver, and if the political state of the silver-producing countries of southern and central America shall become more settled, an increased yield of silver may be expected.

The price of commodities depends, so far as the precious metals are concerned, on the joint amount of gold and silver. A rise, therefore, in the price of silver is by no means incompatible with the absence of a general rise of prices. There would be greater probability of such a general rise should the present yield of gold continue for many years, without disturbing the relations between gold and silver, since this would indicate that a corresponding increase was taking place in the production of silver.

The truth, however, is, that the influence of gold and silver on prices has been greatly diminished in modern times by means of inventions which have economised their use. Prices are affected by credit, and by the substitutes for money which it has created, more than by money itself. These substitutes, which are the growth of the last century and the present, have been equivalent to the opening of mines of the precious metals far richer than those of California or Australia. Monetary transactions have so far outgrown the supply of the precious metals, that but for these representatives of money, prices must have declined with the increase of commodities requiring money as a medium of exchange. The insufficiency of all the gold and silver in the world for the monetary transactions of modern commerce, was lately a favourite argument with the advocates of a currency of depreciated metal, or inconvertible paper.

Regarding the substitutes for money which credit creates as part of the circulation, the largest probable additions to the metallic wealth of the world will bear a very small proportion to the total amount of that circulation. Let us trace credit, therefore, through the different forms which it assumes as a substitute for money, and let us endeavour to estimate the effects of its influence on prices.

In a state of commerce in which credit prevails, its action on prices arises from this, that a person possessed of credit, and *using* it for the purchase of commodities, causes just as much demand for them, and tends to raise prices as much, as if he made an equal amount of purchases with ready money. The forms of credit which create a purchasing power are various. The most simple is that of accounts current, in which two dealers have transactions together, each being a purchaser and seller with respect to the other. The sum of the debts of each is thus set against the debts of the other, and the balance is settled at the end of the year, or at other periods. A few hundreds of pounds, or even a few pounds, may in this way liquidate transactions each of which may be to the amount of thousands. The balance may be settled without the intervention of money at all, by the indebted party making over the debt of a third person to him, through the instrumentality of a bill of exchange.

Bills of exchange furnish means by which the debt of one person may be made available for obtaining credit by another. A merchant, for instance, sells goods to be paid for at three or six months, according to the custom of the trade. If he wishes to receive the money before the usual time, he draws a bill, which he gets discounted by his banker, or other money lender. Bills of exchange not only spare the use of ready money, they in many cases occupy its place, when the bills drawn by one person are paid to another in discharge of any pecuniary obligation. Many bills when presented for payment are completely covered with endorsements, each of which represents a fresh transaction in which the bill has performed the functions of money. As a circulating instrument, acting as a substitute for money, and therefore affecting prices by its purchasing power, it is immaterial whether a bill which passes from endorser to endorser represents a real sale or debt, or whether it belongs to the class of *accommodation*, or, as they are not unfrequently termed, *fictitious* bills, by means of which one person lends his credit to another to enable him to raise money on it. Such bills are, in fact, promissory notes,

with this difference, that they possess the advantage of having two names on them instead of one, with the further security of every subsequent endorser.

The promissory notes of bankers constitute another form of credit. They enable dealers in money to lend not only their money but their credit, which they may be said by these means to coin. They thus lend not only their own credit, but their power of obtaining credit from the public at large. They effect this by lending their notes payable to the bearer on demand, which the borrower receives as money, because he knows that the credit of the lender will enable him to pay them away as money to others.

Payments by cheques constitute a fourth form of credit. If carried to the fullest extent of which they are capable, the use of money might be wholly superseded by them. If the person making payment by cheque and the person receiving it kept their accounts with the same banker, the payment would take place without the intervention of money, by the mere transfer of the amount in the books of the banker. The same would be the case with all the traders in London, if they all kept an account with the same banker; and by means of the London Clearing House, all the City bankers are rendered virtually one establishment. Each banker sends every day to the Clearing House all the cheques which he has received on other bankers, to be exchanged for those which they hold drawn on him, the balance being paid in money. By this contrivance, not only the money transactions of the City of London, but a vast amount of country business, represented by bills drawn by country bankers on their London correspondents, the whole amounting, on an average, to three millions daily, are settled by means of Bank of England notes, to the value of not more than two hundred thousand pounds.

Book debts, bills of exchange, bankers' promissory notes, and cheques, exercise their respective influence on prices, in proportion to the facility or encouragement which they give to the multiplication of credit. Book debts stand the lowest on the scale, because they give the seller on this kind of credit no convenient mode of making the debt due to him from the purchaser a means of extending his own credit, by pledging it as security for a loan, or passing it in payment for goods. Let him draw a bill, however, for the amount, and he can get it discounted on the joint-credit of himself and the acceptor. He can thus obtain money wherewith to purchase goods, or he can pay the bill away in exchange for them. The person to whom it is paid may do the same. Every fresh endorsement will thus represent a fresh purchase.

The promissory notes of a banker have a still greater purchasing power, because they have a more extended credit. A bill of exchange will be taken only by those who are acquainted with the reputation for solvency of the *acceptor* and *drawer*; but a banker has a wider range: his notes are received as money by every one, at least in his own neighbourhood; so that by custom, which has grown into law, a payment by bank notes is a complete acquittance of a debt; whereas in the case of payment made with a bill, the debt would remain undischarged should the person on whom the bill was drawn fail to pay it.

It is only the first holder, therefore, the original borrower of the notes—from the bank—who pledges his own credit to obtain them. Every person into whose hands they subsequently pass can expend the whole of them in the purchase of goods without diminishing the purchasing power which he possessed before—the power of obtaining goods on book credit.

Every object which is attained at present by bank-notes might be accomplished as effectually by cheques, or by transfers in a banker's books. A banker, for instance, instead of lending his notes, might open an account with a merchant, and might credit him with the sum agreed to be advanced, on the understanding that it should only be used by drawing cheques in favour of those to whom he has to make payments in the way of his business. These cheques may pass from hand to hand like bank notes, or the receiver may pay them into the hands of his banker, and draw a fresh cheque against them. In a country district, the drawers of the two cheques generally use the same bank, in which case no payment is made by money, but simply by the transfer of the amount from the credit of one customer to that of the other. If the cheque is paid into a different bank from that on which it is drawn, it will not be presented for payment, but liquidated by a set-off against other cheques. The banker has only, therefore, to provide money to discharge the balance, for which the ordinary reserve of prudent bankers—one-third of their liabilities—will be sufficient. Had he granted this extension of credit by means of an issue of his notes, he must have retained the usual reserve of coin, so that he can give every accommodation by a cheque circulation as by a note circulation. As the act of drawing a check against another which has been cancelled can be repeated as often as a purchase by a bank note, it effects the same increase of purchasing power, and the original loan from the banker becomes multiplied, as a means of purchase, in the hands of every person to whom portions of it are successively paid, just as the purchasing power of a bank note is multiplied by the number of exchanges which it effects before it returns to the issuer.

Bank notes and cheques, therefore, are more powerful instruments in raising prices than bills of exchange, and bills than book debts.

All this purchasing power, however, only acts upon prices to the extent to which it is used; and the willingness of a person to use his credit depends on his expectation of gain founded on the rise of price already in progress; or on anticipated demand arising out of the relations between supply and consumption. Under such circumstances, speculative purchases commence in expectation of profits by an advance of price.

These purchases begin with the book debts, and are

continued by means of bills. A rise of prices is thus often produced which there are no circumstances to justify. As long as there appears a prospect of a favourable result, the credit of the speculative purchasers remains unshaken. If some wish to realize, others are prepared with capital or credit to take their stock off their hands. If events justify the grounds of the speculation, and sales for consumption come in time to replace the capital embarked, all is well; but if events are adverse, and forthcoming supplies are found to exceed the estimated consumption, a revulsion takes place: and if speculation has been very general, a commercial crisis, commonly called a panic, is produced.

During a period of speculation, increased issues of bank-notes certainly came into play, but at a later period than book credits and bills. Advances from the banks are not applied for to make purchases, but to enable those who have made them to hold stock when the usual term of credit has expired, and the expected rise has not taken place.

The extent to which purchases may be carried on by book transactions, was exemplified by the tea speculations of 1839, and the operations of the corn market between 1838 and 1842, and again in 1847. In the corn market there were instances of persons possessing a capital of only £5,000, engaging in speculations favourable in the outset, and favoured by circumstances during their progress, who were able to make purchases to the extent of from £500,000 to £600,000; and of others who, without any capital, were able to make purchases to a very great extent, so long as the aspect of the market favoured their views. These speculative purchases, moreover, were carried on in 1839 and 1840, when the money market was in its most contracted state, and a scarcity—as it is called—of money existed. Credit, therefore, may raise prices, without an increased circulation of specie or bank-notes, by assisting speculative purchases for a rise.

The amount of bills of exchange in circulation in Great Britain at any one time is supposed, from calculations founded on the official returns of bill-stamps issued, to be considerably above one hundred millions sterling. The bank-note circulation of Great Britain and Ireland is less than forty millions, which, during periods of speculation, is not increased by more than two or three millions. The transactions of the London Clearing House amount on the average to £3,000,000 daily, liquidated by means of little more than £200,000 in bank-notes. Who will venture to estimate the total cheque circulation of the country, and the amount of book credits? What effect can an addition, during the course of a century, to the stock of precious metals throughout the world, to the extent of even three hundred millions, have in increasing the purchasing power of such a mass of credit? Substitutes for money have, in this country, superseded in effect the use of money for large payments. Our world of credit, like the world of the Hindoo philosophy, rests upon an elephant, which is supported by a tortoise. The elephant is our bank-note circulation; the tortoise, a few millions of gold in the coffers of the Bank of England. During 1842, this fluctuated between a little less than six millions and a little more than ten millions, the average for the year being about eight millions. It now amounts to more than twenty-one millions and a half, being within about seven hundred thousand pounds of the bank-notes actually in circulation; for more than twelve millions of the notes issued are lying unemployed in the strong room of the banking department. Has this increase in the stock of bullion in the Bank produced any influence on prices? Is there not, on the contrary, a marked disinclination to speculate in produce of any kind, as evinced by the want of demand for capital, and the consequent low rate of interest?

The accumulation of bullion does not appear likely to rise much beyond the present amount; for the exports of it now exceed the imports, and Australia, if it sends us nuggets, is drawing upon us for sovereigns. An efflux of gold, however, is no longer looked on with alarm; so that, though the new gold fields are not likely to produce any great revolution in prices, they will strengthen our golden tortoise, and render the superincumbent mass of credit more secure. T.

THE AGRICULTURE OF THE BIBLE.

A GLANCE AT ITS HISTORY.

A common opinion asserts that all nations sprang from hunters and savages. But this is a mistake. Adam, the first man, was a tiller of the ground. Cain and Abel, his sons, divided agriculture between them, into the arable husbandry and the pastoral husbandry. Three brothers of the seventh generation from Adam made certain great class improvements, which not obscurely intimate that one was a systematic stock-feeder, and another a maker of agricultural implements. Noah understood well the management of vineyards. All the early nations after the dispersion—the Babylonians, the Assyrians, the Hebrews, the Egyptians, the Phœnicians, the Persians, and probably also the Chinese and the Indians—were agriculturists. Men did not advance from a hunter's life to a farmer's one, but receded from a farmer's life to a hunter's one. They fell away from husbandry, and from the high arts connected with it, just as they fell away from the worship of the true God, and from

the practices of peace. And not till great multitudes became idolaters and savages, did many, or perhaps almost any, become 'mighty hunters.'

Another and kindred opinion supposes that agriculture rose originally out of a rude condition, and advanced slowly in improvement. This also is a mistake. The antediluvians probably were better farmers than any who now walk the earth. Adam got his knowledge of physical things in Eden, and, however he may have perverted it, he can scarcely be supposed to have materially lost it. The light of it was a glory, and did not wax dim for ages. Noah took into the ark a large knowledge of natural history, a large knowledge of husbandry, and a large knowledge of religion. The first and the second of these were practically one, and were afterwards put practically together, and they served as truly to pioneer all the future interests of mankind in regard to time, as the religious knowledge served to pioneer them in regard to eternity. 'The chief tribes,' as the present writer has elsewhere remarked, 'retained a goodly knowledge of the principles of agriculture, and transmitted them as precious heirlooms to their descendant nations. The practices of the Noahic family round the skirts of Ararat, were repeated on the Euphrates, and taught throughout all the countries of the dispersion. The earliest nations of the several great regions of the old world all passed through 'a golden age,' when kings were husbandmen, and soils were 'perpetual,' and flocks and apiaries made the lands 'flow with milk and honey.' Poetry, no doubt, waves a magic wand over these early scenes; but philosophy, in the light of revelation and of authentic record, depicts no mean portion of them as assured realities. And our theory, after a careful consideration of the subject, is, that agriculture was in its glory during all the cradling periods of the world, that it shed ease and opulence on the founders and fathers of nations, that it became dimmed and dismal by the volcano-eruptions of wickedness and war, and that it will shine again in a brighter than its pristine glory, only when all men shall behold it through the clear atmosphere of Christianity, when 'they shall beat their swords into ploughshares, and their spears into pruning-hooks, and shall not learn war any more.' The art of the primitive husbandmen may have been simpler, vastly simpler, than ours; but it was at least as well adapted to its circumstances, and it had a happier spirit, and obtained more abundant returns.

The most eminently agricultural of the early nations became the most eminently accomplished and wealthy. They passed from skill in farming to the study of their other arts, and employed the surplus produce of their farms to create commerce and construct great public works. The Chaldeans whose territory was probably the wreck of Eden, had harvests of from two hundredfold to three hundredfold increase, and soon were able to build 'great Babylon.' The Assyrians kept their lands in high fertility by means of skilful and very laborious irrigations, and gradually adorned their metropolis of three days' journey with those masses of sculpture which are striking all the antiquaries of our own day with wonder. The Persians ever dignified agriculture with the highest public honours, and soon became famous for weaving, needlework, and embroidery. The Chinese, whose country is supposed by some Christian archæologists to have been settled by a very early branch of the Noahic family, or even by Noah himself, rose so speedily to magnificence, that all their early history is a golden legend; and, at the periods when other old nations were sinking into decay, or had perished from the earth, they became young again, and originated some wise and peculiar agricultural usages, which have come down to modern times with a stereotyped antiquity. The Phœnicians—the aboriginal inhabitants of Syria, the Philistines of sacred narrative—possessed the gardenesque plain of Sharon, the 'excellency of Carmel,' and the 'glory' of the 'goodly mountain Lebanon;' and so magnificent a surplus produce did they statedly obtain thence for sale over all the countries round the Mediterranean, that their chief seaport soon became, and long continued, 'the joyous city, the crowning city, whose merchants were princes, whose traffickers were the honourable of the earth.' The Egyptians inherited so luxuriant a territory in the long fat valley of the Nile, and devoted themselves so sedulously and enrichingly to its cultivation, that they have been very generally, though mistakenly and absurdly, regarded as the founders of agriculture; and out of the vast, constant accumulating treasures which their husbandry yielded them, they invented arts, created refinements, and reared monuments which will be the wonder of all time. The Israelites were, in several respects, more remarkable than any. The Greeks, the Carthaginians, and the Romans, more or less, ran a similar course to the earlier nations; and even the Peruvians of the New World followed the general law. 'All these nations, anciently celebrated for their agriculture,' remarks Mr. Hoskyns, 'present one common feature—that of long duration; and the extent is remarkable to which in all of them other arts successively flourished, and rose to perfection out of the basis laid by the early industry and success of their husbandry. By supplying a larger annual amount of wealth than was sufficient for the annual wants, it not only rendered them rich and powerful, but it rendered them historical, for the very records of which—in the case of

Egypt, especially, a history and a chronology of the nation might be afterwards collected—could only be bequeathed by means of a capitalised wealth applied to the erection of stupendous architectural works, enclosing specimens of art.'

Palestine, under the Israelites, was an exception to the other nations in the recording of her history, for, though this was inscribed on many a monument, and, most of all, on her temple, it was written also, by divine dictation, in those living Scriptures which reveal the second life to man, and whose lessons and influences will abide and live for ever. She was an exception, too, in the association of her husbandry with the arts; for, though the Israelites till the captivity, and the Jews afterwards, were ever as accomplished, in all matters of general skill and taste, as any of their contemporaries, they never became mainly nor largely a commercial or a manufacturing people, but contented themselves throughout with the pursuits of husbandry. They differed from all their neighbours, also, in the systematic connection of their agriculture with the institutions of the true religion. Their landed tenure accrued from the same covenant which made them the progenitor kinsmen of the Saviour; their rural economy had as surely a divine sanction and a moral aim as their public worship; their agrarian laws were embodied in the same code as their juridical, ceremonial, and moral laws; and, altogether, their special and entire devotement to agriculture was an adjunct of their special and entire devotement to prefigurative Christianity. They often fell off, indeed, from both their husbandry and their religion; but, on the whole, they continued till the advent of the Messiah both to maintain a flourishing agriculture and to profess the faith of the true God. They therefore perpetuated for many centuries the spirit and manners of the patriarchal times; they repeated, down to a late epoch, the scenes which were common among the earliest decendants of Adam and Noah; and ages after other old nations had been either wasted by ambition, or bloated by luxury, or driven mad by heathenism, the chosen people continued to enjoy a vigorous healthiness, or at least all the means of it, under the strictly rural and religious usages of the Holy Land. The flanks as well as the centres of their glorious territory were golden expanses of arable field, where 'floods of corn rolled to the breeze,'

'And peaceful ploughmen then made Arnon glad,
And Kir look proudly o'er her corn-clad vales—
Made Heshbon, joyful, lift her flowery head,
And Sibmah's vine perfume the summer gales.'

COMPARISON OF IT WITH MODERN AGRICULTURE.

The agriculture of modern times has its seat in widely different countries from the agriculture of ancient times. Agriculture, in the general sense, indeed, both modern and ancient, belongs to all climes, and prevails, in some way or other, through all regions; but in the sense of comparative excellence, or in the sense of a system resting on principles, and worked by rule, as distinguished from a rough, rude pokering of the earth by rote and imitation, modern husbandry thrives principally in the cool countries of the temperate zone, and knows little of the droughts, and heats, and glowing sunshine of the husbandry of the ancients. The Romans founded it. These conquerors of the world imported into Italy, one by one, all the good agricultural usages of Mesopotamia, Syria, Egypt, Carthage, and Greece, or at least as many of them as were suited to the Italian climate; and they there cast them into a new form, adapted them to their own wants and soils and implements, added a few inventions, and laid the foundation, or even, in some instances, anticipated the practice, of some of the most boasted improvements of our own day. Roman agriculture became a glory: the greatest statesmen practised it, the most learned writers described it, the most tuneful of all the poets, the immortal Virgil, sang it, and the keenest soldiers and most impetuous victors carried it into other lands. But as it had been mainly derived from the east, so it became mainly lodged in the west. It stood ever connected with hot countries only as a debtor, and never made them any return for what it owed them. It made all its adaptations to comparatively cold climes and wet soils, and set improvement processes agoing which could readily be reduced to the circumstances of colder countries than Italy, but not at all to the circumstances of hotter ones; and almost in the degree in which it had attracted an inflowing tide of knowledge from all the Levant, it sent away an outflowing one to the British Channel and the Baltic. The period of the Roman empire was in every way a transition period to enlightened agriculture, giving it a new seat, an altered character, and totally different aims and appliances. So long as the Roman power was rising to the meridian, enlightened agriculture dimmed in the sunny south, and brightened in the foggy north; and when the Roman power went down to the horizon, Asiatic husbandry lay benighted, and European husbandry was a world of brilliance.

A knowledge of these facts will lead the way to a right understanding of the agricultural allusions of ancient records, and correct many monstrous popular mistakes respecting the comparative economical value of the ancient husbandry and the modern. Nothing can be more erroneous than to test even the present agriculture of the east, and

much more any ancient agriculture whatever, with the present practices of British farmers. The two things are exceedingly dissimilar, and in some respects contrasted. The climate, and soils, and fertilisements, and efficient tillage, and proper harvestings, and even some of the field plants of the several agricultural countries mentioned in the Bible, all differed more or less widely from those of modern Britain. The climate of all was dry, and warm, and sunny; while ours is wet, and cold, and cloudy. The soils of all were more or less shallow, and loose, and parched; while ours are generally deep, and cohesive, and wet. The very uplands, as those of Judea, were kept in heart mainly by means of artificial irrigations; and the great outspread valleys, as those of Egypt and Mesopotamia, were maintained in fertility solely or principally by the floodings of the rivers; while almost all our lands, whether of hill or dale, of pasture or corn-field, require the very opposite appliance of subsoil drainage. The lands of Palestine possessed special capacities for absorbing fertilisements from the atmosphere, and were enriched by depasturement of cattle throughout the year, and suffered no deterioration from the washing action of rains; and the lands of the Nile and Euphrates were kept fat and luxuriant by great annual depositions of silt; while our lands, or any, can be made remunerating from year to year, or at least from rotation to rotation, only by means of great artificial manurings. The dry field-farms of the ancients needed but very slight tillage for either destroying weeds or preparing the seed-bed; and their flood-field farms, especially those of the Nile, needed none whatever, but were stirred only in the way of covering the seed and of very slender after-culture; while all our farms, even the highest and driest, are subjected to deep, repeated, elaborate tillage for every crop, and require, in addition, either to be under a system of biennial, laborious, cleaning after-culture in the manner of the drill turnip husbandry, or to undergo periodically the searching, complicated, prolonged, expensive process of the summer fallow. The harvestings of the ancients, up to the preparing of the corn for the mill, were done under a constantly cloudless sky, and therefore needed no artificial protection, and never suffered any mischance; while ours, in their earliest stages, are often done under fitful changes of weather, and always incur great risk of damage, and, in their thrashing and cleaning stages, can be done only under cover of costly farm-buildings. Some of the field crops of the east, such as vines, olives, figs, pomegranates, terebinths, pistacias, and date-palms, are managed somewhat in the manner of our orchards or shrubberies; and others, such as cotton, rice, millet, pepperwort, sesamum, lentils, gourds, and cucumbers, are powerfully obedient to the influences of sunniness and warmth; while all ours can exist or thrive only in the way of yearly operose groundculture, and must go through all their functions, from germination to decay, within a year, and struggle severely and doubtfully with the weather in every stage of their progress.

Let these contrasts be taken into account, and they will prodigiously alter the estimate which is commonly entertained of the comparative excellency of the ancient and the modern husbandries. Most persons think the agricultural usages of the Egyptians and the Israelites, as mentioned in the Bible, either pitifully rude or nonsensically foolish, and regard those of our own country at the present day as immeasurably superior. But what if all the rudeness and the folly are with ourselves? The chief tillage implement of the Egyptians was a thing more like a pick-axe than a plough, and certainly would be ludicrously useless for breaking up any of our soils; yet it served admirably its purpose of slightly stirring the soft shallow stratum of newly deposited silt. Anything there in the form of our tillage implements would have been monstrous. The plough of the Israelites was so light, that any ordinarily strong man could easily carry it from place to place on his shoulders; and it had hardly power enough to scratch any piece of ground resembling our hardest clays; yet it possessed a noble fitness for the efficient tillage of Palestine—the shallow stirring of a chalky, powdery, and very thirsty soil. The thrashing-floors of all the ancient east were little else than pavements or firm earthen esplanades in the open air; but they exactly suited the method of beating out the grain by means of oxen, and that, again, was best suited to the economics of the climate and the age. So may it be said respecting most of their other appliances. These were the fittest and cheapest which could have been used. No art of those times, nor even any art of our own, could have materially improved them. The operations to be done were facile, the aims were near and direct, the hindrances were few and trivial, and therefore the implements employed, and the practices followed, were light and simple. To have set up any such usages as those of modern Britain, supposing them then possible, would have been as absurd for the ancients as it would be for us to yoke a horse to a wheelbarrow, or to split quills with a hatchet. A sure evidence of the goodness of their farm practices exists in the abundance of their harvests. No people can be said to have farmed ill, who, for years and centuries in succession, reaped from thirty to an hundredfold.

The ancient husbandry, then, was a vastly finer thing than the modern. It fought little with the

wrath of an angry climate, it struggled little in the slough of spongy and mortary soils, it weltered little in the feverish sweat of commercial speculation. It was at once easy, and quiet, and contented. It knew only as much labour as made the winged hours fly cheerily away, and got but slight acquaintance with the whirl and uproar, the heats and maddenings of large towns. It shared as largely as the best modern husbandry can do in all

'The boundless store
Of charms which nature to her votary yields—
The warbling woodland, the resounding shore,
The pomp of groves, and garniture of fields.'

And it possessed them with grander adjuncts, in richer colourings, and with higher glory. It had vastly more of the pastoral element, not only in breadth of verdure and multitudinousness of flocks, but in the picturesque magnificence of patriarchal life, and the occasional splendour of shepherd kings. And how laughingly beauteous, how sumptuously rich, how lavishly varied were its arable landscapes! The Israelitish territory, for example, was from end to end a magnified copy of our finest ideal of a landscape-garden. Its own contour was noble, and its display of the cereals, and herbs, and groves which it produced in common with European countries, was most luxuriant; and, among its other features (to quote again from what the present writer has elsewhere said) 'were the vineyards, festooning the hills with their outspread growth, and impurpling the vales with their clusters of fruit—the olive groves shading the rocky mountains and tablelands all the year round with their ash-grey foliage—the palm plantations waving their feathery heads and their harvests of dates over the sunniest rills of the plains of Jordan—the orchards of fig-trees snd pomegranates, of terebinths, and pistacias, of all other native fruit-trees, and of the kinds which were introduced or popularised by Solomon, dappling and dazzling many of the choicest tracts of both hill and dale with their manifold tints and produce—single trees, and tufts, and groups of all the pleasant and profitable species, scattered athwart the general landscape, and giving luscious relief to fields and pastures; and connected with these were some of the most delightful and elaborate processes of rural labour—the planting and pruning of trees, the gathering of fruit, the clearing of the woods, and the operations of the vintage and the oil-press.'

The ancient husbandry was thus a halcyon thing. Well might the happiest nations rejoice in it, and the greatest sovereigns patronise it! More is said than meets the eye in such pregnant historical notices as these: 'Noah began to be an husbandman, and he planted a vineyard: 'Isaac sowed in the land of Gerar, and received in the same year an hundredfold:' 'Uzziah, king of Judah, had much cattle both in the low country and in the plains: husbandmen also, and vine-dressers in the mountains, and in Carmel, for he loved husbandry.' Think of the vastness of David's royal farm, with its eleven great overseers in eleven great departments; think how the old Persian kings not only practised husbandry on their own royal lands, but twelve times every year mixed freely and convivially with farmers; and think how all the peaceful ancient sovereigns, and some of the warlike ones, too, great and small, over all the east and the Levant, from the earliest times of Babylonia down to the first ages of the Roman empire, cherished agriculture, delighted in its operations, and not unfrequently plied it with their own hands; and see how dignified was the ancient husbandry, how high in honour, how associated at once with mankind's loftiest ideas of utility, and happiness, and magnificence!

The allusions of the Bible to agriculture, therefore, have an incomparably wider sweep, and far more gorgeous hues, than are commonly imagined. They dwell long and lovingly, indeed, on the *peacefulness* of husbandry, and make out from this an enrapturing picture of the world's condition when all swords shall be beaten into ploughshares, and all spears into pruning-hooks. But peacefulness has not always been inherent in husbandry, and was long ago violated as much by hordes from pastoral plains as by armies from towns and sea-ports, and may be violated again by yeomanry, or militia, or levies *en masse*, or agrarian insurrections, as truly as by standing armies or by city-mobs. The real glory of the ancient husbandry was its ennobling influence on the mind. It was not an employment merely, but an occupation—not a thing for the hands only, but a thing for the heart—not a means of livelihood simply, but a source of happiness—not an instigator of earthliness, and greed, and avarice, but a promoter of contentment, and polish, and practical philosophy. It shone all over with wisdom and poetry, and did to the full as much for the mental elevation of its simple people as is done among the money-hunting multitudes of our modern European towns by the best appliances of the fine arts. It was all animus, and life, and power. It knew nothing of the chills and damps, the crushing cares and aching fatigues, the prosaic spirit, and dull, flat, inky, scenery of modern husbandry. Poets, indeed, can throw interest on the latter, but need to cancel some features, and over-colour others; and even they have seldom soared higher than to sing—

'Among the hills 'tis beautiful to see
The lambkins sporting lightly o'er the lea.

The stately steeds yolked graceful in the plough,
The husbandman with bonnet on his brow,
The sower, with his white sheet at his side,
Throwing his hopeful seed with manly stride,
The germing crops, so tender and so green,
The flowers that blush by rivulets half seen,
The song of birds, the murmur of the bees,
The sweet returning leaves on varied trees.'

The agriculture of the Bible has all these features too, but depicts them in warmer tints, and sets them in a more sumptuous frame. Its sheep-walks, and seed-time, and singing of birds, and glories of spring, compared to those of the modern European husbandry, are as a burnished day of July compared to a leaden day of December. And it revels, in addition, among the luscious delights of steady seasons, teeming crops, droughty harvestings, and an outfield profusion of all the fruits and flowers which we associate only with the vinery and the greenhouse. It is all a song as well as a picture—a music of the heart as well as a musing of the mind. And hence does it speak so warmly of 'shouting for the summer fruits,' of 'the gladness of the plentiful field,' of 'the joy in harvest,' and of 'the singing and shouting in the vineyards.' And hence, also does it descant on 'the growing of the lily,' 'the beauty of the olive tree,' and 'the smell of Lebanon,' 'clusters of grapes,' 'boughs of the palm-tree,' 'the smell of mandrakes,' and 'all manner of pleasant fruits,' 'mountains of myrrh,' 'mountains of spices,' and 'the hills of frankincense,' 'orchards of pomegranates with pleasant fruits, camphire with spikenard, calamus and cinnamon, with all trees of frankincense, myrrh, and aloes, with all the chief spices, fountains of gardens, wells of living waters, and streams from Lebanon.'

Nor is all this gorgeousness and brilliance any more than the mere *materiel* of the Bible's agricultural allusions, for the *morale* of them ascends on the fiery chariot of Elijah, and stands with the angel in the middle of the sun. It sheds rays over most departments of revealed truth, and illuminates almost the whole long broad series of ecclesiastical experiences, from the simple preaching of the Gospel till the ripened glories of the mellennium. It speaks of 'God's husbandry,' 'the planting of the Lord;' it tells about the 'good seed of the word,' and the dews of divine influence, and the rains and sunshine of God's work on the soul; it describes how good men grow in grace, like corn on good soil, and how bad men resemble barren land which 'beareth thorns and briers, and is nigh unto cursing, whose end is to be burned.' But especially does it illustrate the philosophy of the propagation of the Gospel, and exhibit an analogy of surpassing beauty and significance between the methods of God's working in the triumphant progress of the seasons, and the methods of his working in the triumphant progress of Christianity.—Hogg's Instructor.

(To be continued.)

LABOUR AND THE POOR.—THE RURAL DISTRICTS.

THE SOUTHERN AND WESTERN COUNTIES.

LETTER XXXI.

(From the Morning Chronicle.)

In treating, in my previous letter, of the cultivation of the hop, I have alluded to the earnings realized by men, women, and children, in the various stages of digging, opening the hills, and poling. I have not mentioned these, however, as the wages at present received, but as the average rate of remuneration in former years, when hop cultivation was a less disastrous business than it has recently been, and when the prospects before it were of a somewhat more encouraging character than they are now. The rates mentioned are not to be taken as indicating the scale of the labourer's earnings during the past year. The declension of wages which has taken place elsewhere in the South and West has extended itself to the hop districts, giving rise to privations, on the part of the labourer, almost equalling those which I have already depicted as characterizing his lot in Dorset, Devon, Wilts, and Somerset. But to this matter I shall have occasion, hereafter, more particularly to advert; my sole object in here alluding to it being to apprise the reader that the rates of wages which I am now about to state, as well as those already mentioned, constitute the average of the past few years, the rates recently received being somewhat lower.

Tying the hop is the next step after "poling," and may, in fact, be regarded as part of that process. As soon as the plant shoots a little above the ground it requires the support of the pole. Its natural instinct is to climb; and to aid it in this effort it is tied, generally by means of rushes, to the pole. Three plants are usually tied to a pole, and the number of poles to a hill is frequently three. Tying the hop is a business which commonly devolves upon women; but it is by no means confined to them. Men sometimes take it, when driven to compete with the women from want of other occupation. Boys may make themselves very expert at it; but it is seldom that children of either

sex are found thus employed, except as aids to their mothers or other adult female relatives, who have undertaken the work. It is almost invariably taken by the piece—a woman engaging to manage a greater or less quantity, according to the amount of time at her command, or of assistance on which she may reckon. Sometimes she takes a certain specified area, and engages to attend to it; at others she takes the work by the acre—the extent of surface which she will manage depending upon her own assiduity, and the aid which she receives. With a little assistance a woman can tie from two acres to two acres and a half per week. In the neighbourhood of Tunbridge, the wages received have been from 9s. to 10s. per acre—making this one of the most remunerative departments of female labour, connected with hop cultivation. In the neighbourhood of Maidstone the wages have been still higher—as much as 11s. and 12s. per acre having been paid. In Sussex the wages have averaged from 8s. 6d. to 12s. per acre, the lowest rates being paid for three-poled, and the highest for four-poled gardens. But the mere business of tying the hop is only the first part of the process. The plant has invariably to be rebound. In most cases this business of binding requires frequent repetition; and in Sussex it is very common for the women to undertake to bind the hop three times to the pole at least. Generally speaking, the plants are visited and rebound every four or five days, until at length they have grown out of reach—which happens in about five weeks.

Like all other out-door work, that of tying the hop is very much dependent upon the weather. Not only does very wet weather interrupt it, but boisterous days, even if perfectly dry, add very much to its amount. At such times, the plants have frequently to be tied over and over again, from having been detached from the pole by the wind, or twisted into positions unfavourable to their growth. Sometimes, too, the poles themselves are blown down, requiring the labour of men to replace them. This seldom happens, however, until the plant is far advanced, and the pole is more or less overloaded by its growth. Hop-tying is one of those operations which, when undertaken, must be performed speedily and briskly. The plant is tender, and the period during which it can be bound with safety is not of very long duration. The labour performed, therefore, is estimated less by the time occupied in executing it, than by its intrinsic value as regards the safety of the crop. It is further enhanced in value by the fact, that, whilst it is labour which must be performed briskly and within a given period, there is not that competition for employment which characterizes the hop-picking season, when there is a vast influx of strangers into most of the hop-growing districts. Hop-tying has all the disadvantages, with but few of the advantages, physically speaking, of out-door employment. It is an occupation requiring more nicety than exertion, and hence it is that it almost exclusively devolves upon women. The period at which it is undertaken is generally about the end of April and the beginning of May, when the weather is occasionally rough, wet, and boisterous. Unless it is altogether too stormy for the women to venture out, the more boisterous the weather the more necessity is there, at this critical period, for their presence in the hop-gardens—for the more dependent is the plant, on such occasions, on the process of binding. This frequently brings them out, when they would otherwise remain at home—and, being engaged all day in the open air, treading the cold, moist soil, without anything approaching to violent exercise to counteract the unhealthy tendencies of exposure in such weather, they very frequently contract diseases which never leave them, and which in many cases are aggravated to a fatal extent by the subsequent exposures of the hop-picking season. Not long since, 12s. per acre was the price at which the hops were tied; it has more recently ranged from 9s. to 12s.

As already intimated, it is seldom that, from the month of February to that of September, the hop-garden is free from occupants, male or female, old or young, employed in some process or other necessary to the rearing of the plant. It is essential to the well-being of the crop that the garden, when it becomes "foul," should be well cleaned—that is to say, cleared of weeds. This process is called "nidgetting" the hop. The operation, however, is designated by a variety of terms, such as "shimming," "nidging," or "breaking;" and in Surrey, sometimes, "becking" and "spudding." In general, the practice throughout the hop districts is to call in the aid of horses in performing this operation. It is sometimes performed by simple hoeing, which, although severe work, occasionally gives employment to women. It is unusual, however, to see women employed at all about the business of nidgetting—the work devolving upon men and boys. The implement used in the nidget or brake, which is drawn by horses. The man guides the implement, and the boy leads the horses. For this purpose boys of various ages are useful, although it is seldom that they are thus emyloyed very young. Digging is severer labour; but they may become adepts at it before they are fit to be trusted with the command of the horses in the process of cleaning. It is not usual to see a boy under twelve in charge of a team thus employed. The process of guiding the team is rather a nice one; inasmuch as the hills, which are only six feet apart, must be carefully avoided—the object being not to disturb them, but to favour the growth of the plants by loosening the ground around the hills, and by cleaning it of the weeds which would otherwise soon choke up the garden. In many parts of Surrey, this work is almost entirely of a manual description, the beck and spud superseding the brake or nidget. In some parts, this work is also done by the piece, but it is now more customary to give it out as day-work. As in the case of all work in which horses are employed, the wages paid for this labour are higher than for other field-work, on account of the superior confidence reposed in those having charge of cattle; and as the work itself is sometimes as nice as it is always highly essential, the wages paid to those occupied in it are comparatively high. Some have told me that they have received as much as 2s. 6d. and 3s. a day whilst thus engaged, in addition to which the boy earns from 6d. to 8d. per day. When performed

by the hand, the severity of the work is taken into account in apportioning the wages to be paid for it. In this, as in other cases, however, the wages of the labourer have materially declined.

Early in September commences the great business of hop-picking. The plant is, generally speaking, ready to be picked at the end of the third year of its growth. By the second week of the month above-named, hop-picking is universal throughout the hop-growing district. It thus follows the corn harvest—so that the labourers of Kent have, as it were, the advantage of two harvests. What this advantage is may be inferred from the fact, that it is generally to the extra earnings of harvest time that the labourers throughout the entire south look as the means of enabling them to buy clothing, &c., and to pay their "Christmas bills." Hop-picking is a work at which all can engage—old and young—men, women, and children. It is an important time for the poor of Kent, Sussex, and Surrey—the comforts of the ensuing winter depending, in the case of most of them, upon the joint earnings of the family during the brief time for which the work lasts. The hop, when ripe, is a precarious product, and must be picked with all possible expedition. Hence it is that all are pressed into the service—children, seven years old and upwards, being then of service in the hop-garden. Such of the schools as are open at the time are sure to be deserted until the hops are picked—when the children, after having added some shillings to the common stock of the family, straggle back again to enter anew upon the work of education. To meet the exigency of the case, most schools now time their holidays with a view to the hop-picking season. There are occasions, but they are few, on which hop-picking is given out as day-work, and I have been told by boys that they have earned 1s. a day whilst thus employed. But, considering the precariousness of the fruit when it is ripe, the great object of the grower is to have it picked and dried as soon as possible; and it is with this view that he gives it out as piece-work, and invites to his aid all the labour that his neighbourhood can furnish, as well as a portion of that which annually immigrates into the hop district at this period of the year. The picker is sometimes paid so much for every bushel that he or she picks—the price being sometimes as low as 1½d., and at others as high as 7d. per bushel. It is frequently 2d. and 3d. per bushel, but seldom rises to 7d. It is more general, however, to pay by the "tally"—a tally being so many bushels, according to agreement. The number of bushels in the tally depends upon the nature of the crop. If the yield is abundant, the number is comparatively large—say ten bushels to the tally; if, on the other hand, it is scanty, the number is smaller—sometimes not more than six or seven to the tally. It is obvious that the more abundant the crop is, the greater is the ease and rapidity with which a given quantity can be picked. This accounts for the variations occurring in the tally in point of quantity, for it is seldom that there is any variation in point of price. The sum paid is generally 1s. per tally, whether it be six, seven, or ten bushels. That it makes very little difference, in point of labour, to the picker, whatever the tally is, is evident from the fact that, whatever it may be, it is seldom that he can pick more than two a day. Thus, if it is ten bushels, the crop is so abundant that, with ordinary diligence, he can pick twenty. If it is seven, the crop is so scanty that, with the same diligence, he can only pick fourteen. It is by calculating what an industrious picker can achieve in a day, looking at the productiveness of the crop, that, in most instances, the amount of the tally is determined—most of the farmers being seemingly desirous to confine a picker's pay to that for two tallies per day. This is certainly but little for a long day's work, considering the great demand which exists for labour during this critical period for the hop-grower. But if the demand is great, so also is the supply; and the influx of strangers, competing with the resident labourers, enables the farmers to keep down wages at this season. But since, with a view to getting the fruit secured as speedily as possible, the grower generally gives the work out by the tally—paying the same per tally, whether large or small—it follows that when his crop is the least productive he pays the most for gathering it in. In former times, when he had a monopoly of the market, this was of little consequence, as high prices, if the crop was generally deficient, compensated him for large outlays; but now that the deficiency in the home supply is sure to be made up by foreign importation, it is questionable if he can in all cases afford to pay as much for the picking of a scanty as of an abundant crop. When fairly carried out, the system is as fair and as favourable as the labourer could desire. But it is not always fairly carried out—the pickers being sometimes in the middle of the garden, and through a great part of their work, ere they are informed what the tally is to be. Thus, sometimes, when they expect that it is not be more than seven, they are told that it is to be ten bushels. There are circumstances in which a farmer can and does thus take advantage of his labourers, but there are others in which it is attempted without success. When the supply of labour is not over-abundant in the district, the attempt to do so might result in the complete desertion of the hop-garden by the pickers at the critical moment.

In average years a man, as already said, can pick about twenty bushels a day. A boy can pick from twelve to fourteen bushels, whilst a woman can pick even more than a man. The work is of a kind for which she is better fitted than the man—her figure being more flexible, her touch more delicate, and her fingers more nimble than his. When a whole family, therefore, are thus employed in the hop-garden, their aggregate earnings amount to a considerable sum per day. Taking a family of four thus employed—say a man and a woman, and two children—they may earn among them from 6s. 6d. to 7s. a day. This favourable episode in their lives, however, is but of short duration—hop-picking seldom extending beyond three weeks in duration. But, at the rate alluded to, they may add about £6 to their means of subsistence for the winter; and this, too, after they have enjoyed the pecuniary advantages of the ordinary harvest. It is, therefore, no wonder that the hop-picking season is ge-

nerally looked forward to by many of them with considerable anxiety, as being the turning-point as regards their means for the year. It interposes like a screen between many of them and the work-house; and if it fails them, they have, too frequently, no alternative but to throw themselves upon the union for the winter. It is seldom, indeed, that you find them relying upon this alone for obtaining the necessaries of life. But they do almost universally rely upon it for supplying them with the means of meeting all the extra expenses to which they have been put, or may still be put, during the remainder of the year, such as for medical attendance, shoes, change of raiment, &c. If they fail in this, they must of course draw for these purposes upon the fund which they would otherwise apply to other purposes; and then the chances will be that they must become the recipients of public bounty before the month of February, when their labour is again briskly in demand. The past year was one of grievous disappointment to thousands of them, in consequence of the almost universal failure of the hops. The great majority of those whom I met in deep distress in Kent attributed much of the privation which they were enduring to having had their calculations falsified in respect to the usual earnings of the hop-picking season. In some portions of Surrey, where the yield was good, they were not disappointed—which was also the case with some labourers whom I met with, in comparative comfort, in the eastern part of Hampshire. I have already said that the hop is but partially raised in this last-mentioned county, but it so happened that, whilst the crop greatly failed in the districts to the eastward, the yield in it was exceedingly good.

I found somewhat contradictory opinions prevailing in regard to the effect which the cultivation of the hop has, in the main, on the health of those employed in it. It is not easy to get at the exact truth in reference to this matter—employment in the hop-garden being so mixed up with other out-door avocations, that it is difficult to trace results, as regards the health of the labourer, to their proper causes. There can be no doubt that, like all other out-door pursuits, when not carried too far, nor persisted in through all weathers, attendance in the hop-garden is conducive to the health of those so employed. But the difficulty with regard to the hop is, that, at some stages of its growth, attendance upon it is imperative, without regard to the weather—and sometimes most so when the weather is inclement and inauspicious. Ordinary farm labourers have frequently complained to me that, without their being consulted, their work and wages were suspended on wet days, or even on wet forenoons or afternoons—many of them regarding it as a less privation to work in the wet than to be deprived of their wages by having their work interrupted. But in the hop-garden, it is frequently during inauspicious weather that they are obliged to work the longest and the hardest—and that, too, even in the case of women and children, to whom the hop-garden affords more constant out-door employment than the corn-fields. Boys are exposed in the garden as early as January, when they receive but little damage, inasmuch as they can take what exercise they please, the duties which they are then called upon to perform being neither more nor less than those of a scarecrow. It is with the approach of the digging season in February that their trials really commence. But here, again, constant and violent exercise counteracts, to a considerable extent, the injurious tendences of a damp soil and a chilly atmosphere. The hazard which the boys then run is that of being overworked, their fathers sometimes making them participate in the heaviest labour undertaken. It is seldom until the pruning season arrives that the women are engaged.

This occurs at a time when the weather is more variable, perhaps, than inclement. Their work, except when they are engaged in opening the hills, is in general of a sufficiently active kind to keep catarrhs and rheumatisms away from them. In opening the hills, except where the soil is very light, they run the risk, like the boys at digging, of being over-worked; but I have heard of but very few cases of anything like permanent injury having been sustained from an over-tasking of the strength at this species of labour. The operation of poling is generally conducive to the health af all engaged in it. But that of tying is sometimes very trying to the women and children employed at it. If the weather is favourable, but little difficulty is experienced, and the work is comparatively soon ever; but if it is otherwise, the labour is peculiarly trying—whilst there is all the more necessity that the plant should be carefully and frequently attended to. It is at this work that the seeds of future disease are first implanted in many a constitution. The exercise is but slight, inasmuch as the work is more that of the fingers than of the limbs and body, whilst the exposure is frequently protracted and severe. In the next process—that of cleaning or nidgetting—the female does not participate; but the employment is conducive to the health of the men and boys engaged in it, although sometimes it over-fatigues the boys, and makes his "legs ache," as he will tell you. So far, the work involves little that is injurious to the health of the adult male; but the subsequent process—that of picking—is one in which he is apt to suffer as any of the others engaged in it. Everything, in this respect, depends on the weather. It is commonly said that, when the weather is good, the pickers leave all their ailments behind them in the hop-garden. But, on the other hand, when it is not—and when there is all the more reason for securing the crop—numbers of them contract diseases which lay them up for the winter. How can it be otherwise, when they are sometimes compelled to stand upon boards as the only way in which they can keep their feet dry when engaged in an occupation which gives but little exercise to anything but the fingers? On the whole, although serious diseases do not appear to be more common in Kent than in the other agricultural districts which I have visited, I must say that in that county I have met with more of the peasantry "ailing," in proportion to their numbers, than elsewhere. Few of the medical men of the county admit that much of the disease which prevails amongst the labouring classes is attributable to the nature of their occupations—most of them tracing it to the malaria engendered

by insufficient drainage, to the habits of the people themselves, and to the defective state of their dwellings with regard to ventilation. There can be no doubt that here, as elsewhere, insufficient drainage is a prolific cause of physical derangement—particularly in the valley of the Medway, which occasionally overflows large tracts of the country through which it runs. Of late years, means have been taken, and not without success, to confine these inundations to more contracted areas—and in other places, which are still subject to overflow, an effective system of drainage relieves the land of superfluous moisture, soon after the subsidence of the river. There can be no question, however, but that the work in the hop-garden, particularly in the lower grounds, is a cause superadded to those otherwise existing, of such disorders as ague, influenza, and rheumatism; and in some seasons it is not a minor one.

In corroboration of this, I find, on examining the very elaborate tables contained in the Eighth Annual Report of the Registrar-General, recently published, that the average mortality during each of the eight years from 1838 to 1845 inclusive, has been the greatest in that section of the hop-growing district in which the plant is most largely produced. In Kent the mean average for the eight years stands thus:—Out of every 100,000 males, 2,078 have died during each of the eight years in question; whilst out of every 100,000 females, the number who have died has been 1,838; taking both males and females, the mean average will give 3,916 deaths out of every 200,000 persons. In Sussex, on the other hand, the proportions stand thus:—Taking the same basis as above, the average number of deaths per year has been—males, 1,865; females, 1,766; and of both males and females, 3,631. In Surrey the following is the result—male deaths per year, 1,856; female deaths, 1,715; male and female, 3,571. I compare the three hop-growing counties together, because they closely resemble each other in their physical features, thus meeting the objection which otherwise might have been raised to the comparison, on the score of differences of climate, geological formation, and other circumstances. It will be seen that Kent, where the hop is most largely produced, exceeds the other counties in its average rate of mortality. It might be supposed that, on the same principle, the mortality should be greater in Surrey than in Sussex—the growth of the hop being at least more ubiquitous in the former than in the latter county. But it must be borne in mind that large tracts of Sussex are, as is the case with Kent, subject to annual inundations, from which Surrey is exempt; giving rise, from want of sufficient drainage, to a malaria which is very prolific of disease. And this makes the comparison, as between Kent and Sussex, at least, hold good. If the Medway overflows its banks, there are thousands of acres of meadow land between Petworth and Arundel annually under water—so much so that in travelling between these two points in winter one might almost fancy himself in the lake country. The sections of the metropolis falling within Kent and Surrey are of course excluded from this comparison.

I have already incidentally alluded to the effect produced on the rate of wages by the influx of strangers which annually takes place during the hop-picking season. It is not easy even to approximate to a correct estimate of the numbers who then pour from all quarters into the chief hop-growing districts. It is not so much to the population of the different counties in question that a great addition is then made, as to that of certain localities within them. Take Farnham, in Surrey, for instance, and the neighbourhood of Maidstone, in Kent; and the entire population which converges upon them about the beginning of September is, to a great extent, drawn from the surrounding towns and parishes. It is true that there is a great deal of what may be strictly regarded as imported labour—numbers of Irish, and of strangers from the purlieus of London, making their appearance in the hop districts on the occasion. They come in droves, sometimes whole families emigrating together; at others, only a portion of the family embarking on the adventure. When families thus appear in fractional parts, it is more commonly from the surrounding parishes that they come than from beyond the limits of the county. The mother and children will come for instance, leaving the father at home, engaged perhaps in some other occupation. The new comers, so far as they can do so, obtain accommodation in the cottages of the resident population. In districts in which great numbers annually converge, sheds are frequently erected for their reception; since, with all the crowding to which they will submit, but a small proportion of them can be accommodated in their cottages. Not a few of them—the Irish emigrants in particular—bring with them contageous disorders, which sometimes spread and commit ravages amongst the resident population. Scarcely a year elapses, I am told, without small-pox and scarlatina appearing amongst them. The most prompt means are generally taken to check the extension of any malady so manifesting itself by the removal of the patients. When the season is wet and unfavourable, the immigrants run even a greater risk of incurring disorders than the residents; for, bad as is, generally speaking, the house accommodation of the latter, that of the former is, in the main, worse. Such of them as crowd the cottages of the residents serve to render the latter more liable to disease than they otherwise would be. Their stay in the hop districts lasts altogether from five to six weeks. They begin to make their appearance from a week to ten days anterior to the commencement of the picking, and it is fully that time after the work is over ere they are fairly got rid of. Until the work begins they are frequently in a state of the greatest possible destitution. Depredations of all kinds are then committed by them for a supply of food and fuel. They are, in general, a somewhat unruly set; but it is usually admitted that the Irish are not the least peaceable and well-disposed amongst them. Indeed, in other parts of the country, subjected to an annual visitation of Irish migratory labour, testimony is readily borne to their industry and good conduct whilst the work lasts. If they break out at all, it is when they have got some money in their pockets—not when they are perfectly destitute, or are earning

their wages. It is, indeed, generally observed by the captains of steamers plying between Ireland and Liverpool, that it is when they are returning home that they are the most riotous. They are, in most cases, quiet and subdued, when on their way to England, and tolerably well behaved, until they are about to quit it with a few sovereigns in their pockets, when, in far too many cases, they become turbulent and troublesome.

But we have not yet done either with the hops or with the hop-garden. After being picked, the plant has to undergo the processes of drying and pocketing, which also afford employment to a considerable number of persons. This, however, does not last long, since, in addition to its being desirable that the hops should be ready for market as soon as possible, they must be dried (as they must be picked) within a limited period, or they run great risk of being spoiled. The work afforded in the garden, after the picking is over, is that of pulling up the no longer useful plant, and stacking the poles. This is generally the work of men and boys, and is commonly undertaken by the piece, the price paid being usually from 5s. to 6s. per acre. The poles are pulled from their places in the hills, and put in stacks or upright piles together, in which state they remain until they are again wanted for the support of the plant. The garden is then deserted for a brief period, after which it is again manured—to be again dug, preparatory to receiving a new set of plants, to be tended and managed in the different stages of their development as their predecessors had been.

Such is the cultivation of the hop in Kent, Surrey, and the eastern half of Sussex. It is a department of industry which affords employment, where manufactures do not exist, to thousands who would otherwise be unemployed, or who, if occupied at all, would be so at tasks unsuited to their age or sex. It also furnishes employment to others at periods when their ordinary pursuits may be slack or interrupted; for the hop-garden has its seasons when it calls for the presence of the man, as at other times it requires that of the woman and the child. That a department of agriculture furnishing so large a stock of employment to so great a number of people, and distributing that employment over the greater portion of the year, superadded to the ordinary pursuits of an essentially agricultural district, should have a tendency to keep up the general rate of wages, including those of the ordinary farm-labourer, is too self-evident to be dwelt upon. It would be erroneous, however, to attribute the higher scale of wages paid for farm-labour in the hop-growing district exclusively, or even mainly, to the presence of an extensive and regular hop-cultivation. If the labour in demand in the hop-garden were in all respects such as competed with that chiefly in request in the field, its effect upon wages for field-work would be greater than it is. But the employment which it affords is such as devolves upon those who are, some of them, of but little use, and others wholly unavailable, in ordinary field-labour. It, therefore, in the main, comes in addition to, instead of in competition with, ordinary farm labour; and thus has the effect of enhancing the farm-labourer's means, without materially effecting the wages paid for farm work. But there is a very great difference between the wages paid for farm-work in the hop-district, and those paid in the counties to the west of it—a difference which is generally about 50 per cent. in favour of the former. What else is there to create this difference, if the cultivation of the hop but partly accounts for it? The great cause is the proximity of the whole district to the metropolis. Approach London from the south or west—and I speak of these directions only, because it is to them that my inquiries have been confined—and you find the scale of wages gradually rising from the moment that you enter within the circle of its influence. That circle embraces almost the whole of the hop-growing district—wages being similarly affected in such portions of it as may not be regarded as within the immediate range of metropolitan influence, by the different places of fashionable resort and of business which gird it from Brighton to Gravesend.

OUR FRIEND—THE POTATO.

At a time when fears are again being expressed as to an extensive failure of the potato-crop, a few words about the history of this useful esculent may possess a more than ordinary interest:—

In the year 1584, the celebrated voyager and courtier, Sir Walter Raleigh, stood in high favour with the "virgin queen;" and, ever ambitious to extend his power and wealth, sought for and obtained from his royal mistress a patent for "discovering and planting new countries not possessed by Christians." This document gave him power to appropriate, plant, and govern the territories he might acquire. Nor was he slow in availing himself of the privileges thus bestowed on him. Undismayed by a previous personal attempt, and by an abortive expedition in the preceding year, in which he had adventured £2000, he organized a body of colonists, who sailed for the shores of America in 1585, under the government of a Mr. Lane. They landed on the eastern shore of that continent, near Chesapeake-bay, and named the colony Virginia, in honour of the queen. Instead, however, of adopting Penn's policy, and seeking by honest and fair means to obtain a permanent footing in the country, the misconduct and aggressions of the colonists soon plunged them into hostilities with the Indians, and in less than a year they were glad to make their escape and abandon their colony. They re-embarked on board Sir Francis Drake's squadron, which visited the coast on its homeward voyage. Futile and void of any useful aid as the expedition seemed, it nevertheless re-

sulted in the introduction into England of two plants which have exerted a very important influence on after-ages. The governor, Mr. Lane, brought home for the first time tobacco, which he had seen used by the natives; and Sir Walter Raleigh introduced smoking into this country. One of the colonists, named Thomas Heriot, wrote an account of the country, in which he describes a plant called "*openawk*." He says: "The roots of this plant are round, some as large as a walnut, others much larger; they grow in damp soils, many hanging together as if fixed on ropes. They are good food, either boiled or roasted." This was the root now so well known as the potato: and, however, we may incline to doubt whether the introduction of tobacco has been a benefit to this part of the globe—for the universality of the custom of smoking is no proof of its utility—there can be but one opinion as to the vastness of the benefit conferred by the naturalization of the potato amongst us. So universal has the use of this root become, that we are apt to look upon it as a common thing, and to think slightly of its immense importance. We shall, perhaps, be able to estimate its value more rightly, if we compare the condition of our ancestors *without* it, with that of our countrymen of the present day *with* it. But more of this anon.

The potato, as well as the tobacco plant, was brought home on the return of this expedition, and was first cultivated by Sir W. Raleigh, at Youghal, in the county of Cork. An amusing anecdote is related of its early history there. Sir Walter's gardener had with care planted the roots he had received from his master, and had diligently tended them till they had flowered, and the flowers had given way to the round green berries—the "potato apples," as they are called. Ignorant that the value of the plant lay in its tuberous roots, and not in its berries, he brought one of the "apples" to his master, and asked if *that* were the fine new American fruit? The knight, having examined it, either was or pretended to be so dissatisfied, that he ordered the "weed" to be rooted out. The gardener obeyed, and in rooting out the "weeds" found a bushel of potatoes.

The cultivation of the potato very gradually spread in Ireland: but nearly a century had elapsed before it could be said to form an important portion of the means of sustenance to the inhabitants of that country. In England it met with much less favour; for it was considerably more than a century before it came into anything like general cultivation, and in many parts, so lately as 1770, it was rare to meet with a whole acre of potatoes. Lancashire seems to have been the first scene of potato-culture in England, where the mechanics and cottagers found it a valuable addition to their means of subsistence, from the ease with which it could be grown, and the abundant nature of its produce. By some it was at first esteemed a delicacy. The old botanist Gerarde cultivated it in his garden, and gave a drawing of it in his well-known "Herbal" under the name of "Potato Virginia:" he recommends that the root should be eaten as a delicate dish. In the reign of James I., we are told that potatoes formed one of the articles provided for the household of the queen, and that their price was 2s. per pound. But all the efforts of Raleigh, and even the patronage of Queen Anne, were not sufficient to push the potato into favour, although the philosophers of the day gave it their recommendation. A committee of the Royal Society was appointed to inquire into its merits; all those Fellows of the society who had suitable lands were entreated to plant them with it. But it was of no avail: the root had long to contend with many and popular prejudices, as too many a useful invention or discovery has had to do. One author (Mortimer), writing in 1708, sneeringly says, that "the root is very near the nature of the Jerusalem artichoke, although not so good and wholesome; but that it may prove good for swine." Woolridge, three years later, says: "I do not hear whether it has yet been essayed whether they may not be propagated in great quantities for the use of swine and other cattle." Another writer speaks of them only as being good "for poor people." A still more strange prejudice against them was very prevalent amongst the Scotch, on the ground that "potatoes are not mentioned in the Bible;" and they were, therefore, regarded as unhallowed food. It is not, therefore, wonderful that, with the rude modes of cultivation prevalent in those days, the potato was long in making head against the prejudices with which it had to contend, and taking its position as the universal, useful, and agreeable esculent it now forms.

Nor was the proper way of cooking it better understood. When the first potatoes which had been raised in the county of Forfar were cooked and served up, they adhered to the teeth like glue, and were far from agreeable; and the poor potato would have been condemned through the ignorance of the cook, but for the opportune arrival of a gentleman who had tasted a potato in Lancashire. At his recommendation, the half-cooked vegetables were remanded back to the hot turf-ashes, till they became as pleasant as they had before been nauseous. This was in 1730, two years after it had been fairly introduced into cultivation in Scotland. The mode of its first introduction is interesting, as showing how the absence of prejudice, and the earnest,

persevering attempt by trial to ascertain its real value, soon raised the despised potato to deserved esteem. It was a poor cottager, a day-labourer, living near Kilsyth in Stirlingshire, named Thomas Prentice, who maintained himself in part by the produce of a little plot of ground, who first successfully attempted the cultivation of the potato in Scotland. Having by some means obtained a few roots, he planted them in his little field, and tended them so carefully and judiciously that the produce was very valuable, being almost instantly in demand among the neighbouring cottagers and farmers, who saw its use in propagating other crops. Prentice continued thus to supply his neighbours, till in a few years he had saved £200—no small fortune to such a man. He afterwards invested his capital in an annuity, on which he lived comfortably to the age of 86, having witnessed the general adoption of his favourite root, and the blessings it had conferred on his country. The year 1742, which was long remembered in Scotland as "the dear year," was, however, mainly instrumental in promoting its universal cultivation. Old people, who were living at the beginning of the present century, represented the state of things in the summer of 1743 as truly dreadful. Many of the destitute wandered in the fields, seeking to prolong the misery of existence by devouring the leaves of peas, beans, sorrel, and other plants; while many perished of absolute starvation, and others were swept away by the fevers, and those diseases which always follow in the track of famine. This general state of distress drew the attention of most people to the potato, and its great value as a substantial article of food became so apparent, that its cultivation soon became general both in garden and field. The urgent necessities of a superabundant and wretchedly destitute peasantry in Ireland, and the famine in Scotland, promoted the rapid growth of potato-culture in those countries to a much greater extent than in England, where the absence of any such powerful stimulus retarded its progress. Towards the latter end of the last century, however, the prejudices which had at first been excited against it had in great measure subsided, and its value was in consequence more truly appreciated: it began now to form an important part of English husbandry; and, in 1776, no fewer than 1700 acres in Essex were planted with potatoes, for the supply of the London market.

Its history on the continent has been almost a *fac-simile* of its progress in our own country. Similar prejudices existed against it there: to such an extent did they prevail, that, in Pomerania, Frederick the Great compelled the unwilling inhabitants to receive it by force of law. In Sweden, the celebrated Linnæus plied his efforts and recommendations to the same end, but to little purpose, till, in 1764, a royal edict was issued for the encouragement of its culture. In Switzerland, it appears to have met with less opposition, and the Swiss peasants grew potatoes on their mountain sides in abundance, and learnt the art of drying them and grinding them into flour, and making them into bread. A peasant bought a small field near the Alps, and in two years paid the purchase-money by the profits of its potato-crops. The root is now as extensively cultivated in many parts of the continent as in England. It has also been introduced into India; and though there at first the subject of violent dislike, it seems to be coming into great favour with the natives. In fact, its culture is fast becoming universal.

It is a singular fact that the potato belongs to a natural order in the vegetable kingdom remarkable for its acrid and poisonous properties—the order to which the deadly nightshade, henbane, capsicum, mandrake, thorn-apple, and tobacco belong. It seems strange to find so valuable an article of food among such suspicious companions; and it may seem equally strange, that the only species of the potato genus (solanum) which inhabit England are both of poisonous nature: they are the common nightshade (solanum nigrum) and the bitter-sweet (solanum dulcamara). Both are common plants. The potato (solanum tuberosum) appears to have been originally a native of the western coast of South America, where it grows wild from 34 degs. south latitude to at least 10 degs. or 20 degs. north latitude; that is, through the subtropical, tropical, and equinoctial zones. It is usually found on cliffs, hills, and mountains near the sea; and is most abundant near Valparaiso, Mendoza, Quito, Lima, and Santa Fé de Bogota. In its wild state the flowers are always pure white, not purple-tinted as in its cultivated state with us. It is needless to describe a plant so universally well known, or to enter into details as to the manner of its cultivation. It may surprise many, however, to be told that the tuber of the potato, which forms so valuable an article of food, is not a root, but an underground stem: and that this is no mere scientific refinement will be evident to anyone who will carefully take up a potato plant and examine it. The long, fibrous, real roots will then be readily recognized; while the tubers which grow from them will be seen to be sprinkled with buds, or "eyes," as they are commonly termed. Now, buds are never found upon real roots, and their presence is so characteristic of the stem, that even though it is growing underground, as in this instance, its real nature is at once shown by them.

The potato, like some other highly-cultivated plants, is subject to peculiar *diseases*. One of

them is the *curl*. When attacked by this disease, the plant ceases to grow, and becomes of a sickly appearance just at the time when the tubers should form; so that the produce, if any, is small and of bad quality. This disease first made its appearance in Lancashire in 1764, and rapidly spread over the potato districts of Britain, exciting general fears that the plant would be exterminated. Many theories were framed to account for it, and many remedies advised; but all in vain, till at length it was found that it arose from planting, as seed potatoes, tubers which were quite ripe. By the abandonment of this plan, and by saving such for propagation as were not fully ripe, it has been observed that the evil could be entirely prevented.

The disease which for the last six or seven years has infested this useful plant is of a very different nature. In the *potato-murrain*, as it has been called, the plant is commonly attacked after the tubers have been formed and have attained some considerable size. The leaves have been observed to be first affected. The decay usually appears as a bluish-brown spot, on the under side of the leaf, and very rapidly extends, till the whole of the plant above ground is destroyed and rotten. Often the whole process has taken place in a single night; and a field, which one day has looked healthy, green, and vigorous, has next morning exhibited only the smitten, blackened, and decaying haulm. The disease of the tuber appears to be consequent upon that of the plant: the substance of it turns brown, emits a very peculiar and unpleasant odour, and soon decays to a fetid, watery matter. The fearful ravages which this disease occasioned in the potato-crops of this and the sister country, in 1846-7, is doubtless vivid in the recollection of all. Space would fail us to detail the miseries which were suffered by the Irish peasantry in that awful winter; how the privation of food, clothing, and warmth, in that inclement season, hurried thousands to their grave from sheer starvation; how they dropped down by the waysides; how malignant fevers, the sure successors of famine, made frightful havoc among those whom want had spared; how corpses wanted coffins; and how bodies were left without burial, from the debility which want of food had brought on their neighbours; how all the better feelings of human nature seemed to be extinguished by the extremity of the distress: details such as these might be multiplied in their most horrible forms, but we must forbear. The facts are still too fresh in general recollection to require any repetition.

Various attempts have been made to account for the potato disease. Some have attributed it to an insects (aphis rapæ); others to volcanic exhalations; others to a peculiar state of the atmosphere; others to minute fungi or moulds. The last supposition appears to be nearest the truth. A minute fungus (botrytis infestans) appears to be almost invariably connected with the disease, and is found on the decaying plants: the attack of the parasite being probably aided by some predisposition in the state of the vegetable, induced by the season or the atmosphere. It is a singular fact, that the epidemic seems to have prevailed throughout the world, and that even the wild potatoes of Chili, &c., were attacked by it. Various as were the theories as to the origin of the disease, still more numerous were the methods proposed for its cure. It does not appear, however, that any certain preventive has yet been discovered. Most methods proposed have answered in some cases, and failed in others. The cause, whatever it may have been, though still in operation, had seemed of late years to have very much abated in virulence; and it was hoped that the disease would in time disappear, where due care was taken in the cultivation. A top-dressing of quick-lime was considered one of the most successful preventives of it. At the moment we write, however, the disease seems to have returned—in some places with greater virulence than in 1846. We have beside us a return from various counties in England, which gives a very black summary of the progress of the disease on the early crops. Before this paper reaches the public, however, the extent of the calamity will have been nearly ascertained.

The potato has other uses besides its property as an article of food. One important application of it is for the purpose of extracting its starch. If fresh potatoes are rasped into a vessel full of cold water, the fluid will be found to assume a milky appearance; and if then strained, and allowed to stand, the water will become clear, the fecula or starch settling at the bottom: 17 lbs. of starch may thus be obtained from 100 lbs. of potatoes. This farina or starch is very similar to arrow-root; it is very nourishing, and if properly prepared, may be kept a long time. Even diseased potatoes, if fit for no other use, may be employed for this purpose, and their starch will be as good as that of sound roots. If carefully heated till vapour rises from it, it loses its character as starch, and resembles gum. In this state it is very extensively employed, under the name of "British Gum," in the processes of calico printing, and for stiffening different fabrics.

But, important as these applications are, the main use of the potato is as an esculent. Its great value is not, however, generally appreciated. It is in part to the potato that we owe the extended term of human life that is now enjoyed in Britain; for that the *average duration* of life has considerably

increased during the last century is indisputable. The banishment of at least one fearful and formidable disease also may be attributed to its universal use, and the change which it has mainly introduced into our habits as a nation has probably been the chief means of disarming other complaints of their virulence, and of rendering them of infrequent occurrence. Before the introduction of the potato, carrots and turnips were equally unknown in England, and the main diet of the people used to be butcher's meat, with ale and bread. During at least two-thirds of the year, the great bulk of the population lived on salted meat, and without any vegetables but bread. In those days, one of the most fearful scourges of England was scurvy; not that slight affection of the skin popularly known by that name, but a malady of great malignity and virulence, accompanied with frightful ulcerations and a general putrid tendency of the fluids of the body. Every winter this pest swept off multitudes in these northern regions, and afflicted thousands more with sufferings which caused them to drag on a weary existence. In the British force of 6,000 troops, stationed about a century since at Quebec, 1,000 were swept away by scurvy in one winter; and 2,000 more were so shattered in constitution, from the same cause, that they were obliged to be sent home. It has been most conclusively proved that this awful scourge was the effect of a deficiency of vegetable food, together with the free use of salt provisions; the use of a vegetable diet, in persons affected with it, having always been attended with the prompt amendment of their symptoms, and frequently with an entire restoration to health. To the potato, then, as furnishing us with an abundant, cheap, and wholesome vegetable diet, especially during winter, are we mainly indebted for our almost total exemption from this disease. In some of our prisons, it has occurred that the diet of the prisoners, though amply sufficient in other respects, has contained no potatoes, or only a small quantity of them. The consequence has been, that scurvy has broken out among them, but has been promptly removed on the addition of a few pounds of this vegetable to the weekly dietary. During the construction of the Hawick railway, the "navvies," in consequence of the high price of potatoes, lived on meat and bread; and, as the sure result, an epidemic of scurvy broke out among them. These, then, are some of the uses of the potato—a vegetable which well deserves the appellation of "the friend of man."

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A Monthly Council was held at the Society's House, in Hanover-square, on Wednesday, the 3rd of November. The following Members of Council and Governors of the Society were present:—Lord Ashburton, President, in the Chair; Earl of Ducie, Lord Berners, Sir John V. Shelley, Bart., M.P., Colonel Austen, Mr. Raymond Barker, Mr. Barnett, Mr. S. Bennett, Mr. Blanshard, Mr. Brandreth, Captain Stanley Carr, Colonel Challoner, Mr. Druce, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Jonas, Mr. Kinder, Mr. Lawes, Mr. Lawrence, Mr. Milward, Mr. Pusey, Professor Sewell, Professor Simonds, Mr. Simpson, Mr. G. Turner, Professor Way, and Mr. H. Wilson.

Finances.—Mr. Raymond Barker, Chairman of the Finance Committee, presented the report on the accounts of the Society, from which it appeared that the current cash-balance in the hands of the bankers was £706. He also laid on the table, for the information of the members, the quarterly statements of account, showing the income and expenditure, invested capital, and liabilities of the Society.

Prize Essays.—Mr. Pusey, Chairman of the Journal Committee, reported the following Awards made by the Judges of Essays:—

I. To John Donaldson, of 4, North Cumming-street, Pentonville; the Society's Prize of 20*l.*, for the best account of the Cultivation and Management of Underwood, founded upon actual experience, and discussing the following points:—1. The nature of the soil; and when it had been recently planted, the mode of preparing it. 2. The average number of plants per acre. 3. The description of underwood growing. 4. The best sorts to be planted. 5. The cost of fencing and draining. 6. The comparative produce of not less than five acres under the common, and under an improved system of management.

II. To Finlay Dun, Jun., Lecturer on Materia Medica, &c., in the Edinburgh Veterinary College; the Society's Prize of 20*l.*, for the best account of those Diseases in the Horse and the Ox which either are or may become Hereditary.

Mr. Pusey also informed the Council that the Judges had "commended" the Essay on those Diseases in the Horse and the Ox which either are or may become Hereditary, bearing the motto: "Perituræ parcite chartæ."

Veterinary Grant.—Sir John V. Shelley, Bart., M.P., Chairman of the Veterinary Grant Committee, presented the following report, which was unanimously adopted by the Council:—

The Committee having examined the Report of the Royal Veterinary College, find that, for the last year, Professor Simonds has been liberated from all duties connected with the Horse Department in the College, and has delivered

to the pupils additional lectures in the branch relating to cattle, sheep, and pigs, namely, five lectures in the week instead of three; the Committee are, however, of opinion that the connection of the Society with the Royal Veterinary College might be made more practically useful:—

1. By investigating particular classes of diseases or subjects as may be from time to time directed by the Council;
2. By delivering lectures in the Council-room of the Society; and,
3. By supplying a detailed report of the cases of cattle, sheep, and pigs, treated in the Royal Veterinary College.

With this amended system, the Committee recommend a renewal of the grant.

On the motion of Mr. Brandreth, seconded by Mr. Simpson, it was then resolved that a grant of £200, for the current year, should be made by the Council to the Royal Veterinary College.

Implements.—On the motion of Colonel Challoner, the consideration of the conditions and general regulations of the Gloucester Implement Prize Sheet were referred to the Implement Committee, with a request that they would report their recommendations to the Council at their next Monthly Meeting.—On the motion of Mr. Pusey, seconded by Sir John Shelley, it was ordered as an instruction to that committee, "that they should take into their consideration the best means for enforcing greater punctuality in the presentation of the Judges' Reports."

Age of Pigs.—Mr. Milward presented, on the part of the Stewards of the Cattle Yard at Lewes, a report on the cases referred to them by the Council on the ages of particular pigs exhibited at the last country meeting of the Society at that place.—This Report was adopted by the Council.

Vice-President. — Notification was made of the vacancy occasioned in the list of the Vice-Presidents of the Society by the death of his Grace the Duke of Wellington, which, by the standing regulation, would be filled up at the ensuing Monthly Council on the 1st of December.

Inoculation for Pleuro-pneumonia. — Communications from Lord Stanley, one of her Majesty's Under-Secretaries of State for the Foreign Department; from Sir Emerson Tennent, one of the Secretaries of the Board of Trade; from Professor Simonds, of the Royal Veterinary College; and from Dr. Willems, of Hasselt, in Belgium: were received with thanks, and referred to the Veterinary Committee of the Society, with a request that they would report the result of their investigation on this subject at the next Monthly Council in December.

Fat Cattle.—The Earl of Ducie reported to the Council the extensive communication into which he had entered, during the autumn recess, with the greater number of those judges who had acted at the several country meetings of the Society; and the investigations he had made into the proceedings of the Society from its establishment, in reference to the increasingly stringent, but as it had proved, ineffectual instructions of the Council to repress the evil of awarding prizes intended for breeding stock to animals obviously inconsistent, on account of their over-fed condition, with that character. He was glad to find, with only one or two exceptions, that although no case had occurred of an animal being disqualified on account of its fatness, the whole of the judges with whom he had communicated were decisive in their opinion that something ought to be done to arrest an evil which threatened to undermine and frustrate the primary object of the Society in this branch of its operations. His lordship had ascertained that the Highland Society already found the same tendency to exhibit fat stock in the breeding classes gradually creeping into their exhibitions, and that very summary and exclusive measures had been taken by that Society. The Royal Agricultural Society of England would, he hoped, be able to derive advantage from the result collaterally derived from these measures of their friends in the north; in the meantime, he conceived that he had established a *prima facie* case for the appointment of a committee, which he hoped the Council would grant him, to take into consideration the whole question of the condition of animals qualified to be shown as breeding-stock.—The following committee was then unanimously agreed to; namely, the Earl of Ducie chairman, Lord Berners, Mr. Milward, Mr. S. Bennett, Mr. Brandreth, Sir John Shelley, Mr. Simpson, Mr. Fisher Hobbs, Mr. Brandreth Gibbs, Mr. Shaw, Mr. Druce, Mr. Kinder, Mr. G. Turner, and the Stewards of the Yard.

Miscellaneous Communications.— From Col. Seymour, a report on the trial made with artificial manures on drained and undrained land in Windsor Great Park. From Mr. Barugh Almack, a statement of the advantages of Portable Farm Buildings, suggested as a remedy in some degree for the scarcity of farm labourers. From M. Letellier, a request for opportunity to test practically his mode of preparing seed-grain. From Mr. Bryant, a letter on his plan of cultivation and manuring; and from Mr. Turner, a statement in reference to the same. Letters from Mr. Crosskill, suggesting a prize for a bone mill; and from Messrs. Gibson and Richardson, suggesting a prize for a clod-crusher. Letters from Mr. Robinson on Reaping Machines, and from Mr. Barthropp on Veterinary inquiries. The Council ordered their usual acknowledgments for these communications.

The Council then adjourned to Wednesday, the 1st of December, the intermediate Wednesdays being reserved for meetings of the Guano-substitute Prize Committee, the Agricultural Implement Committee, the Veterinary Committee, and such other Committees as may find it desirable to assemble for business connected with reports to be made at the ensuing December Monthly Council.

AGRICULTURAL IMPLEMENT ASSOCIATION.

Colonel Cartwright has addressed the following letter to the Members of the Northamptonshire Agricultural Association :—

Gentlemen,—At our last meeting held at Northampton, on the 30th of September, I ventured to suggest certain rules for the formation of a "District or Parochial Agricultural Implement Association," with a view of assisting industrious occupiers, whose strength is likely to give way under the present burthens they have to carry; and also of benefiting those who, although stronger in pocket, have still many difficulties to overcome.

It appears worse than folly to blink the question of Protection, being, at all events for the present, thrown overboard by those whom farmers have looked upon as their best friends. The relief which may be expected by some to be given to tenant farmers, by the shifting of burthens from one back to another, would most probably be more directly conducive to the benefit of the landlord than the tenant, inasmuch as most burthens upon land ought to have been taken into consideration by the prudent landlord and tenant, when the rent was fixed for the farm; and if so, rent would in most cases rise in proportion to the burthens removed.

When we find ourselves thrown upon our own resources, we are necessarily stimulated to exertion, and it is with a hope that the suggestions laid before you may obtain consideration in the minds of landlords as well as tenants, that I claim your attention.

It must be clear to all classes of politicians, that as things are, one of the farmers' best chances of competing with low prices, must be in employing implements or machinery, which will do his work at less cost than when it is done by manual labour. Every person who has one grain of common sense in his head must see that a man who ploughs with four horses at length, and a man and a boy, and an old parish plough, has no chance with one who ploughs the same description of soil with two horses, one man, and an improved implement—that the farmer who thrashes his grain by flail will be undersold by the farmer who thrashes his corn by steam power—that the reaping machine, when brought to perfection, will do its work cheaper than the sickle—that clod crushers, horse hoes, drills, and scufflers, will immensely diminish the account for labour—and that the value given by such improved implements respectively, in enabling the owner of them to take advantage of markets and seasons, is, to say the least of it, worthy of mature consideration.

In order, therefore, to place these advantages within the reach of all industrious occupiers, my suggestions have been offered. To illustrate the working of this scheme, take a parish containing 2,000 arable acres, whose value, at 25s. per acre, would amount to £2,500 per annum. Now, in order to found a district or parish association, suppose the landlords of the property subscribe towards it five per cent. on their rentals; that sum would give, upon the whole arable acreage of the parish, £125 as the landlords' honorary donation; add to these the members' subscriptions, at four shillings an arable acre, which would give £400; and as a total for the purchase of implements, the first year, a sum of £525.

This sum would furnish for the 2,000 acres

One steam thrashing machine,
Four reaping machines,
Four general drills,
Four clod crushers,

and a balance to be laid out in those implements best adapted to the soil.

With these implements the 2,000 acres might be worked in the most economical manner, and each member of the association might benefit in his turn by them, as much as if he had them in his own possession; with this further advantage, that he would always have them in good order, which perhaps would not be the case if they were his own, as in all probability they would then be left in his shed for many months totally unnoticed.

The quarter of 2,000 acres being 500, that would be the proportion in wheat crop; and taking four quarters per acre as an average yield, the gross produce would be 2,000 quarters; the steam power, thrashing forty quarters per day, would give an average employment of the engine of fifty days in the year, for thrashing out that crop. The reaping machines, which, from what I have witnessed of their working, I believe will next season be brought to perfection, by the skill of our noted rival implement manufacturers, would average fourteen acres per day, four of which implements would therefore cut the average wheat crop of 500 acres in nine days. These implements would also proportionally perform the same service for the spring crops, and, without entering into further detail, the same effect would be produced by drills, clod crushers, &c., scufflers, &c. The difficulty attendant upon the formation of this association I look upon to be that of getting it fairly started, and it is to the landlords I would appeal for their assistance in this particular. If they consider that 10 per cent. given back from their rents, frequently disappoints them in their expectations of the relief intended to be so given—sometimes being money ill spent, creating jealousies and dissatisfaction amongst neighbours—they may be sure that such a sum given to an Implement Association for one year would be of the utmost value to all the neighbouring tenantry, as well as to themselves, as it would be the means of giving assistance to the industrious farmer, and of having their own land worked and cleaned, upon the most improved farming principles, by those from whom the old ties of mutual attachment would make them the most reluctant to part.

The occupier no doubt would at first say that he might require the same implement the same day that it was in use by others. But when he reflects upon the rapidity with which the work may be done, and the expense to be saved by its use when he gets it, he will find that although he might be the last on the list for its use, he would be amply repaid by even then obtaining its assistance.

An objection to this scheme will be perhaps urged, that by it labour would be displaced. To such an argument I should say that although it would inevitably deprive the labourers of a certain description of work now done by hand, it would put money in the pocket of their employers, which would most indubitably find its way back into the hands of the labourer for other remunerative employment, as no one knows better than the farmer, that the cheapest labourer he can employ is the man who can do the best day's work; in order to perform

which he must have ample means within his reach of supporting nature.

In conclusion, allow me to add, that if an association on these principles was fairly started, I feel satisfied that the annual payments, as drawn up in the rules, would keep up the stock of imp'ements, and that the money spent in subscription to the association would soon prove itself to both landlords and tenants to be money well invested. Whether any association may be formed or not upon these suggestions I cannot say, but I trust that my brother members of the Northamptonshire Agricultural Association will believe that my only motive in making them public is to assist the cause of the hard-working, industrious tenant farmer, so as to enable him to grapple with his difficulties, and to live, doing good to himself and others, upon the farm which in very many cases has been occupied by his family for many successive generations.

W. CARTWRIGHT, Colonel.

Flore House, Weedon, Oct. 20th, 1852.

ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

REPORT OF THE SOCIETY'S COMMITTEE OF JUDGES ON TRIAL OF IMPLEMENTS, AT ABBOTSTOWN, OCT. 13, 1852.

(Abridged from the Royal Agricultural Improvement Society of Ireland's Journal.)

PULVERIZERS OF THE SOIL.

'CROSSKILL'S CLOD CRUSHER.—This implement fully maintains its character, and perhaps few contrasts present more oppositely rude and skilled labour than the array of men who may be seen during a dry spring breaking the stiff clods one by one, in preparation for green crop, with mallets, and this powerful crusher reducing a breadth of six feet with three horses, after the grubber that has raised them to the surface. In very foul land it has two disadvantages—the couch and other root weeds have a tendency to clog it unless when perfectly dry, and it cuts and breaks them up in a manner that tends to their propagation, and in such instances we should prefer the common roller, though in tolerably clean or very stiff c'ay land this is greatly superior. We hope that these crushers may be extensively tried and reported upon, not only in soils of various tenacity and stiffness, but also as to their effect when used in early spring upon old pastures where the pressure and earthing, by the tread of sheep, are known to be so beneficial in spreading the growth of white clover and the most valuable grasses. Further, this crusher, by interval revolving parts being taken out, could be used beneficially in working between green crop drills.

"GIBSON AND CO.'S, OR THE NORTHUMBERLAND CLODCRUSHER.—This implement appears to us to be not correctly named. Its action upon the clods, at Abbotstown, was that of fine wheels slicing the soil, but leaving a fluting of pressed earth, which we were able to lift up like diminutive horse-shoe tiles; the second series of wheels completely clean the first, and there is no clogging; but it wants the abraiding principle of a true crusher, and seems to deserve more the name of a land presser. We think that as such in light soils, it would be a most valuable precursor of the barley or wheat crop, and are satisfied that wherever minute subdivision connected with pressure of the surface is desirable, it is very well adapted to effect the object. It was drawn with much greater ease than the clod-crusher.

"THE NORWEGIAN HARROW.—This was the first time we believe that this implement has been at work in this vicinity, and it attracted general admiration, drawn with a pair of horses, with apparently not more exertion of power than is required by an ordinary plough, cultivating a breadth of five feet, the earth of which was reduced to a fine state. It separated with its revolving teeth or tines the rough ridge, and turned up the mould instead of pressing it downwards, and thus pulverized without showing any injurious marks of consolidation. The three rows of star-shaped tines playing into each other, produced a perfectly self-cleaning action. Altogether, it appears to us that this implement is capable of effecting good on almost any soil whenever the land ought to be tilled at all, and that it will probably soon prove a most valuable auxiliary to the grubbers, which ought to be more extensively used.

"We have here an instance of three implements, all excellent in their various adaptations, but which scarcely can be brought into competition with each other, though to us it appears that the Norwegian harrow can be more generally used with advantage. We then proceeded to the trial of the several field grubbers.

"KIRKWOOD'S GRUBBER.—This is an excellent implement. It is adjusted, by a very ingenious piece of mechanism, to creep over furrows, and maintain its depth throughout; the adjustment of the tines being also such as to cause the weeds and clods to be thrown off laterally, instead of being drawn within the framework, and so choking the implement. The draught of the one exhibited, which covered a width of five feet, and worked with seven tines, would not, in ordinary soils, be excessive for two good horses. This and the following work to a maximum depth of between twelve and fourteen inches.

"FIVE-TINED GRUBBER, BY LAW, OF SHETTLESTON.—This was selected for competition with Mr. Kirkwood's from its having been tried at Hamwood, in the autumn of 1851, against the grubbers produced by Mr. Sheridan and Mr. Graham, implement makers, Dublin, when it was judged superior to them in every respect. It is an excellent implement, and very generally used in Scotland; but we think Kirkwood's superior.

"Mr. LA TOUCHE'S GRUBBER, price £3 10s., has only three tines, but these work to a maximum depth of sixteen inches; it is constructed with great simplicity and strength, and seems admirably adapted to the uses of the small farmer.

"RITCHIE'S GRUBBER.—This implement (constructed somewhat similar to Tennant's grubber but without wheels,) was also worked, and it is thought it may prove a useful two-horse implement in a variety of light soils free of rocks and boulders.

"The improvement introduced last year by Mr. Tenant, of Shields, Ayrshire, in his grubber, in making the tines with square bar-iron, set diamond-ways, and the practicability of adjusting tines to a greater or less width of intervening space, according to the work required, are points well worthy of the manufacturer's attention.

"Our notice was next directed to several drill-grubbers. The proper time and place for trying these implements is a turnip-field, in June; but we thought it desirable to see the working of several (selected from the museum) in the track of the grubber and crusher. Of these, two seemed

to do the work well—one by Miller, of Dunleer, and one by Kirkwood.

"The next implements tried were the subsoil ploughs, which we worked in the furrow, following a common plough. Reid's did right good work to a depth of seventeen inches, but required the full draught of four powerful horses; it consists of a frame with four wheels, and one strong tine with a cutting edge, and cast-iron sole, rivetted on this tine or coulter. It is apt to be dragged back, so as to work at an angle acute to the surface; and we think that a back-stay, similar to those in Mr. La Touche's grubber, would materially tend to its efficiency and lightness of draught.

"Mr. KIRKWOOD'S SUBSOIL PULVERIZER is a closely-set, three-tined, strong grubber, which stirs the soil with which it comes in contact, and breaks it up, and operates to the depth of sixteen inches worked by four horses, and twelve inches with two horses.

"Messrs. BARRETT, EXALL, and Co.'s SUBSOILER has a cast-metal share with double sock, one over the other, fixed in a wooden frame. It takes much less power than either of the former, works to about twelve or fourteen inches in depth, but would scarcely break up the soil sufficiently in clay land. On a variety of soils, however, it would work well and economically, and be particularly useful in opening drains after the first sod was cut out. These are all useful implements.

"SKIM PLOUGHS by MESSRS. STANLEY, and by HILL and Co.—From the outward appearance of these when exhibited at Galway, we anticipated some practical results, but we were soon disappointed in our expectations. Their object is to cover and cut a greater breadth than several ordinary ploughs, in skimming the surface of stubbles, &c., to a depth of three or four inches, so as to enable the harrows to shake out and gather the weeds, the bulk of which usually penetrated only about that depth. One of the most fatal errors in our autumnal tillage is the deep ploughing of stubbles at once, so as to bury and propagate endlessly the couch, crow-foot, and other creeping weeds. We can only speak of these implements as they worked in a foul stubble, and as the clods were gathered into the inside of the frame, instead of being thrown off literally (as in the working of Kirkwood's grubber), they so frequently clogged up as to render the useful working of either of them impracticable in such land. What we have said in the beginning of our report, however, of the adaptation of different implements to various soils, must prevent our disapproving of these double skims, except under the present circumstances. They were worked in the same trim that they were put in at Galway by their owners. The horses and yoke were good, and every endeavour made by skilful workmen to get them to work, but in vain. As far as we can speak of these implements already exhibited at our shows, we think a good graving or skim plough still a desideratum, and we hope to see such introduced ere long, as it is greatly required in Ireland. Kirkwood had upon the field a stubble and couch rake, not unlike Crosskill's. There are many varieties of this implement, which is scarcely known or appreciated sufficiently. The saving of labour and time in gathering weeds or rack out of foul land is incalculable.

"We have now only to notice two drill sowing machines, one by Smith, of Peasenhall, Suffolk, and one by Mr. Ritchie, of Ardee.

"Mr. Smith's is upon the cup principle adopted by all the best makers, such as Smith, Garratt, Crosskill, &c., and in general use in all the most improved agricultural districts of England. The above would stamp its practical value, and proves that as it really effects the object of depositing the seed evenly at the same depth, and in rows admitting the air and hoe during the growth of the crop, the outlay will prove moderate in proportion to the saving and advantages of its use. If we can save six or eight stone of seed corn per acre, the saving in forty or fifty acres would return the outlay for such a machine in one season. We had no ground sufficiently prepared for sowing at Abbotstown, but the machine was worked so as to show its action, which is very simple. The changing of two wheels, which is the work of a couple of minutes, regulates the exact quantity which is to be supplied by the revolving cups, which throw the corn into the delivery pipes in one constant unvarying stream. The coulters make a narrow drill where the seed is deposited and covered by the same operation, and only requires the roller to finish the sowing. In all these operations it is evident that the utmost possible accuracy has been obtained; every grain is deposited at the same depth, and in a regular line. A very ingenious steerage has been lately adapted to enable the driver to guide it in a right line, and it can be instantly thrown out of gear at the headlands, and seems to us calculated to fulfil all the conditions required for good sowing of corn, pulse, or turnip seed, when sown on the flat.

"Mr. Ritchie's is a cheaper implement; the coulters are well arranged, and it is no doubt a very great improvement upon the sowing sheet, but the delivery is by no means so accurate or so easily regulated as in Smyth's. The box containing the seed has a stirring rod revolving in the centre, which forces the seeds against oblong holes in the box, and through them into the delivery pipes; but the long seeds such as oats, are very apt to get across the aperture and stop the whole until freed by poking. The apertures are diminished in size, or closed, by slides moving simultaneously, and the work on the whole, though good, still we think the principle and delivery not so good as in Mr. Smyth's drill, which is well worth the difference in expense. The drill coulters in the latter can be regulated to any desired spaces, and when land is laid down with grass seeds or clover, the advantage of a free current of air over the plants, and the weeders being able to detect and extirpate every weed, even during the advanced stages of the corn crop, cannot be too highly estimated.

THE PLOUGHS.

"The four following ploughs, though worked well in the stubble ground at Abbotstown, were reserved for a future and leisurely trial on lea ground.

"The ploughs so to be tried are:—

1. Miller of Dunleer's Plough.
2. Ponton's.
3. Kirkwood's East Lothian Plough.
4. Law's Plough.

"Winton's collection of spades, digging forks, &c, exhibited by Edmundson and Co., Dame-street. These implements were worked with much effect, are of first-rate material, and great utility. The judges highly commend them.

(Signed) CHARLES W. HAMILTON.
FINLAY W. CUSACK.
THOMAS HARKNESS."

The report was unanimously approved of and adopted.

AGRICULTURE AND THE RURAL POPULATION ABROAD.

LETTER No. XLIII. FRANCE.—No. XXVI.

THE VALLEY OF THE RHONE — THE MULBERRY AND THE SILKWORM.

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

I write from the centre of the silk-making district of France—from the banks of the Rhone, about half-way between Avignon and Lyons. Hereabouts, near the little town of Montélimar, the mulberry was first planted in French soil. The event took place as early as the close of the 15th century. An old French agricultural writer attributes it to the journey made by Charles VIII. to Naples. Some few gentlemen of the royal suite, remarking the richness and glossiness of the Italian silks, determined to try whether they could not introduce at home the creation of equally splendid fabrics. Accordingly, says the old rural chronicler, when the wars of Italy were finished, they sent to Naples for mulberry slips, which they planted in Provence, the slight difference between the climate of southern France and that of central Italy favouring the speculation. The experiment—a whim, in fact, of the gay noblesse of the French Court—attracted probably little attention at the time, and the planters of the white mulberry trees near Montélimar had, in all likelihood, but a faint idea of the grand element of wealth with which they were enriching their country. I am told that old men still living have seen the crumbling trunks of these, the first French mulberries. One very ancient tree still survives, near a village called Rousset. The date of its plantation is unknown, but a species of not ungraceful homage is paid to the vegetable patriarch by the peasantry. It still produces a few leaves, but they are never gathered, for fear of exhausting the feeble remnants of sap contained in the grey old tree. The seeds or roots imported by the cavaliers of Charles VIII. flourished their bravely, and the mulberry tree now forms a very important part of the rural riches of the south of France—abounding in a greater or lesser degree from Lyons, or thereabouts, to Toulon, on the right-hand, and Toulouse on the left, and being particularly luxuriant along the valley of the Rhone and its tributaries. The mulberry is comparatively a hardy tree. It has been grown, and made annually to produce a crop of leaves, as far north as Stockholm, and it stands out greatly against frosts which rain the almond tree for the season, and the olive for ever. It mingles and flourishes with the willow and the oak of the north, as well as with the spice and oil trees of the south. The warmer parts of Europe are never visited with frost on the one hand, or heat and drought on the other, intense enough and long-continued enough to kill it. Of the south of France, however, the district comprised by the departments of the Drôme on one side of the Rhone, and the Ardeche on the other, may be said to form the head-quarters of the mulberry tree. There not a field exists unplanted with silkworm fodder, and the rearing of the insects; and the first stages of preparation of their produce, furnish most important items of agricultural industry. In the department of the Drôme alone, the number of mulberries is computed to exceed 3,000,000—and this independently of a great quantity of dwarf trees of the same class, reckoned as equal to about 300,000 more. The plantations are said to increase at the rate of about two or three per cent. per annum. The quantity of silk-worm eggs annually hatched is stated to amount to about 60,000 ounces; and each ounce, in prosperous years, is computed to produce no less than from 50 to 60 lbs. of silk. The average price of a pound of cocoons is about 1¾f. The average price of a pound of spun silk is about 24½f., each 13lbs. of cocoons producing about 1lb. of silk. The total benefit computed to arise to the department by the sale of cocoons is about 5,000,000f. The sums paid for spinning the silk in the department amount to about 700,000f., and for performing other processes connected with the manufacture to about 1,100,000f.—making nearly 7,000,000f. annually gained for the district by the labours of its silk-worms.

Few readers will require to be told that operations connected with the silk-worm last at the utmost for only two months of the year, ranging from the beginning of April till the end of June. The breeding or "*education*" of the insects is curiously universal. The farmers, the peasantry, the rural inhabitants of the villages and small country towns, and to some degree the population of the faubourgs of the large towns, are all, when the season comes round, silk-worm breeders. Every man, in fact, who has a patch of land, plants it with mulberry trees, and almost every man who has mulberry trees rears worms, and either spins the silk in his household or sells the cocoons. A trifling minority of farmers may content themselves with rearing the mulberry tree and selling the leaves; but the profit of producing the thread is so great, and the trouble comparatively so small—falling, in nine cases out of ten, on the females of the family—that the production of the valuable fibre is all but universal.

There are few or no regularly or scientifically constructed silk-worm breeding places, although the writers on the subject are continually recommending the erection of *magnanaries*—so these places are called—duly ventilated, and prepared expressly for the reception and convenient breeding of the worms. Barns, lofts, lumber garrets—or whatever outbuilding, so that there be a fire-place

in it, which comes handiest—is used; and the apparatus with which the place is for the nonce fitted up is, perhaps, none the less efficient for actual working purposes than it can be cheaply come by and easily knocked up. Travelling through the district in the winter, the only actual vestiges of silk-worms which I saw where the stores of eggs for next season, commonly stuck upon folds of cloth, and looking very like assortments of small beads, but carefully folded in multitudinous wrappers of towels, and laid by in the warmest nooks of the kitchen cupboards. When the early summer time begins to vivify the world, and the mulberry leaves to get juicily ripe, the eggs are hatched—more anon of the several processes employed—and the barn, or stable, or hayloft to be employed is cleaned out and the apparatus arranged. The latter, as it is commonly used, is easily described. I have alluded to the huge bamboo-like canes or rushes which grow in the swamps and by the river banks. These are cut, split open, and attached together, so as to form long cane beds, about 2½ feet broad, called *claies*. Ranges of these couches are then stretched shelvewise from one end of the barn to the other, upon a rude system of frame work easily erected—two or more passages, according to the breadth of the chamber, being left longitudinally for the attendants to traverse. The *claies* are arranged one above the other, the lowest about eighteen inches from the floor, the others at like spaces up to the ceiling, if necessary. The place thus presents the aspect of a great barn-chamber, completely filled with long, narrow cane-work shelves, resting upon a rough extempore framework of timber, and traversed by narrow passages from end to end. The worms, as soon as they are hatched, are strewed along the *claies*, and the mulberry leaves at the proper moment sprinkled over and among them. Precautions are generally taken to ensure something like an equality of temperature. Holes are cut in the floor and walls to allow the entrance of air, and stoves are used if the nights prove cold. The attendant makes use of a short ladder to ascend to the higher *claies*. In some of the better class of establishments, however, a different and superior arrangement is adopted. The *claies* are ranged so as to hang from the circumference of large wheels placed at each end of the apartment. By turning these wheels the ranges of shelves rise and fall, and are transferred from side to side at the pleasure of the attendant. Brisk currents of air are thus made to play amid the silkworm beds—a good fresh atmospheric supply being usually that which the insects suffer most from the want of—while the operator can bring each system of shelves readily to his or her hand, for the necessary cleaning and feeding of the worms. At the proper moment the creatures are furnished with due facilities for spinning the valuable nest in which they enclose themselves and their eggs. Hedges, or fences so to speak, composed of the cuttings of brushwood or some such substance, are stuck erect in long lines adown each *claie*, supported between the shelves, and bristling with tough twigs and tiny forked branches. Up these the worms climb, and in them they lay their eggs and spin their cocoons. The whole structure of framework and shelf is then pulled to pieces, the brushwood hedges extracted, and the little bunches of silken film picked carefully out from amongst the twigs. The worms inside are killed by the application of steam or boiling water, and if there be a sufficient number of women in the establishment, the spinning of the fibre commences; if not, the cocoons are sold to the agents of the spinners and throwsters, who proceed from farm to farm, gathering in the silken harvest of the year. The labour of attending to the silk-worms during the several stages of their short existence is a very trying and harassing one. The operator must be continually on the alert, cleaning the *claies*, providing fresh masses of leaves, regulating the temperature by means of the stoves and air holes, and removing the dead, sick, or dying worms. The creatures have always to be tended the last thing in the evening and the first in the morning. Where great pains are taken, they are even visited and arranged during the night. This labour, in general, falls upon the women. "There is little sleep for us in silk-worm time," said a buxom old lady who was showing me her stores of eggs in a poor-looking Ardeche farm-house. Sometimes, however, the peasants of the Cevennes, who are esteemed the most skilful silk-worm breeders in France, descend from their hills at the proper season, and are employed in the larger establishments. In the department of the Drome it is calculated that about 600 arrive every year to undertake the silk-worm tending in the principal farms. They take the whole charge of the operation, from the hatching of the eggs to the production of the cocoons, and are paid about 2f. per day. The women do not gain above 24 or 25 sous, although they do the work just as well as the men. The person who performs the duties of the *magnannarie* has also to strip the mulberry leaves for food for his or her charge—so that the office is, as may be conceived, no sinecure. The cocoons secured, the *claies* and their supporting frame-work are carefully piled up in any out-of-the-way corner, ready for the requirements of the following season, and the barn or loft returns for the rest of the year to its proper employment.

After the above general sketch of the manner of silk-worm rearing in France, the reader will probably be willing to accompany me through some more minute details as to the culture of the mulberry tree, and the principal steps in the curious process of the *éducation des vers à soie*.

I have stated that, through the principal silk-producing districts of France, almost the entire face of the country is planted with this indispensable tree. Sometimes it is arranged in regular plantations, the corn or grass beneath being a secondary consideration; sometimes it is planted in long double or single lines, cutting the fields into narrow stripes. The regular hedges and paths, and the main and cross-roads, are invariably planted with the shrub, and few farm-houses are unprovided with a sheltered corner, in or near their gardens, in which colonies of the precious seedlings are growing. The tree upon which all these pains are expended, and which brings in so rich a return, is a sufficiently ugly and unpicturesque-looking affair, scrubby and moppish like the olive, and so regularly cut, and twisted,

and pruned as to destroy anything like individuality about each distinct specimen. Its principal visible peculiarity and the result of the mode of culture employed, is that the tree generally presents the appearance of a trunk, sending forth half a dozen stumps of thick branches, cut short near the body of the tree, and each garnished with a more or less plentiful and thriving crop of vigorous twigs about a yard in length, upon which the precious leaves are produced.

The mulberry is generally reared from the seed. When a plantation is to be formed, the seed is gathered in June and July from old trees which have been left for that purpose unstripped of their crop of leaves. The germs thus obtained are flung into water; those which float are thrown away—those which sink are saved for use. The destined spot for the plantation—the more sunny and sheltered the better—is either ploughed repeatedly, or the soil well loosened by hand labour. Manure is applied, and the ground carefully levelled. The seed is sown in May, generally along shallow furrows, about six inches broad, and covered with a thin layer of earth. Weeding and watering are not neglected during the summer and autumn, and dog-grass, which an old French farmer told me he cordially hated, is very carefully rooted out. As the slips shoot up, the most thriving of them are pulled from the ground by the hand, after the fashion of radishes, and replanted in another patch of well-stirred, manured, and loosened earth—care being taken that the roots of each seedling are well and solidly covered by the soil. As the shrub increases in size, it is regularly pruned, to prevent it from throwing out too many branches, and the ground is very carefully cleared from weeds. Very generally, the young mulberry is improved and quickened by grafting. The ungrafted slips, called *sauvageons*, are said to live the longest; but the grafted mulberries produce by far the heaviest crops of leaves. The harvest yielded by the *sauvageon*, from the smallness of the leaves, is tedious and expensive to gather, while the leaf of the grafted mulberry is said to weigh nearly three times as much as that of the *sauvageon*. As the trees grow up, the soil is ploughed or otherwise worked every August, and the young shoots are pruned, so as to concentrate the sap as much as possible, and prevent the seedling from being weakened by an over-rapid growth. About the fourth or fifth year, the mulberries are dug up from the plantation to be set in their places in the field; as yet they have yielded nothing, the scanty crops of leaves having been permitted to grow untouched. As to soil, the mulberry is by no means difficult to please. As a general rule, the fields in which the tree is planted thickly are the most middling parts of the domain. Marsh land is the only species of soil in which the tree makes no way—its growth is affected, its leaves in such situations turn yellow, and afford but a small and unwholesome supply of food to the insect for whose behoof it is reared. The mulberry is often planted along with the vine, although the propriety of the practice is a mooted point, some cultivators maintaining that the two plants thrive best in brotherhood, others that the mulberry ought always to be reared alone. As a general rule, however, it is held in the south that where the vine flourishes the mulberry will also do well. Care is, however, at all events taken never to allow the latter to be overshaded by any higher-growing trees. The mulberry loves the sun, and languishes if the golden light be not lavished upon his leaves and branches. A tree well exposed to the solar influence will, it is said, grow twice as quickly and to twice the size of one less favourably situated. This being the case, the relative distance at which the trees may be most profitably planted becomes an important object of consideration. Average mulberries, planted at two metres or seven feet distance from each other, will have—so a great authority upon the subject calculates—not more than fifteen years of useful life. The statement, of course, refers to a superficial plantation, and not to single or even double rows of trees. The distances which ought to be kept depend, however, necessarily, in a great measure, upon the size of the tree; and mulberries are of many species, growing to many different dimensions. The largest trees are sometimes planted as much as 28 feet from each other; the next largest at from 14 to 17 feet; the dwarf or coppice variety at from 6 to 8 feet; the species used for hedge-rows, and set in a straight line, not more than a few inches apart. In localities exposed to the Rhone fogs, the spaces are advantageously left larger. The trees are generally planted in regular squares, and it is held to be of importance to surround the field thus laid out by a species of zone or border sown with oats, barley, or rye, which is very generally cut down green for the cattle. Grass may be grown among the mulberries, but the plan is not recommended, and in a thoroughly well-managed plantation corn is never thought of. Planting each tree at the distance of 14 feet from its neighbours, a hectare of land will contain about 720; at 23 feet it will contain 230; at 36 feet it will contain about 95. Previously to the trees being set in their positions, the earth is well broken up, and the *sujets* are planted along ditches dug to the necessary depth, or sometimes formed by large ploughs drawn by a strong team of oxen. Once fairly planted, the mulberry groves receive two ploughings per annum. In the smaller exploitations, hand labour is employed instead, care being always taken that the operation shall not be performed during periods of intense heat and drought. Different opinions exist as to the quantity of manure which ought to be applied to the mulberry, and at the time at which it is to be laid down. The more compost used, the quicker the tree comes to maturity, and the sooner—so think many cultivators—it dies. Some mulberry-growers manure the trees every third or fourth year. Others leave longer spaces of time between the operations. The compost is ordinarily the usual stable litter, and is mingled with the ground either by manual labour with the hoe, or by the help of the plough.

The most difficult and delicate portion of the task of the mulberry grower is the pruning of the tree, so as to cause it to produce each year the greatest quantity of the richest and the juiciest leaves. So far as I can understand, there seems to exist a great deal of pedantry in the various systems of "taille" as they are recommended and

practised by different cultivators. In almost every district you will find some conventional shape, which it is held necessary to give the tree, and without which it is believed the produce would be very inferior. Mulberry farmers indeed appear to be possessed with the idea that they can improve upon nature in arranging the development of the branches, just as the old-fashioned nurses held their swathings and bandages to be necessary to give infants a "fine figure." The more enlightened growers cut and prune the tree with a different end in view, contenting themselves with thinning the occasional over-luxuriance of the branches, clearing away languishing boughs in favour of the neighbouring vigorous shoots, and always aiming at the introduction of as much air and light as possible into the body of each tree. As a general rule, also, the object is to prevent the development of thick branches—upon which, of course, leaves do not immediately grow—and to encourage the abundant shoot of fresh, young slips, which summer will see clothed with the richest foliage. The pruning season, in the most skilfully managed plantations, is in the early spring, February and March. Then the tree is said to sleep, and the operation to be far less hurtful than when the advancing spring has set the juices in active motion. Occasionally, however, the pruning process takes place in summer—principally for the sake of economy in hand labour—the leaves upon the cut-down branches serving for the food of the worms or their *claies*. The methods of pruning are very multifarious. There are different *tailles* pursued in almost every district, by almost every proprietor, and for every different species and age of the tree. After some study of the subject, I confess I can see little diversity in principle in these numerous methods; and the reasons by which each cultivator recommends his system are commonly founded upon purely and minutely technical grounds, connected with the manner of branching of various species, the activity of the sap at various seasons in various localities, and sundry other similar circumstances, into which I need not enter. Suffice it to say, that the best *taille* is that which combines the richest harvests of leaves each year with the method tending most surely to husband the resources and lengthen the life of the tree. A late improvement, only partially introduced, and adopted for the most part only by the more extensive growers, is to leave every year either a third or a fourth of the trees unpruned and unstripped—the untouched proportion thus enjoying a rest for which the amplitude of its yield in the following season is said amply to compensate. The pruning operations, like those relating to the olive tree, give well-paid employment to a great proportion of the labourers of the district, 40 sous being a common daily wage for a tolerably expert hand.

The mulberry may be made available for feeding in the second year of its growth; but it is held to be very desirable to permit its leaves to shoot and fall undisturbed until the tree attains double that age. Dwarf mulberries are commonly stripped in their third season—the intermediate class in their fourth—and the largest trees, called "plein vents," in their fifth summer. The leaves are gathered by the hand, and some pains and skill are necessary to glean the harvest satisfactorily. Careless stripping is one of the faults which a mulberry grower has most to guard against in his servants. The leaves ought to be gently removed, and not a twig is, if possible, to be broken. As I have already said, when, as is generally the case, silk-worms are bred in the farm, the person attending to them strips the trees as the food is wanted. When the mulberries are cultivated only for the purpose of selling the leaves, the harvest is gathered in as soon and by as many hands as possible, and despatched to the large worm-breeding establishments, which buy it. The second crop of leaves is, as I have also stated, invariably used, either green or dried, as fodder for the cattle. It is reckoned of importance that the gathering of the second harvest should be postponed until as late as possible. The produce of the mulberry, like that of the olive, is very various. From three to six quintals of leaves may be taken as the ordinary range, although trees exist capable of producing ten quintals. The price of the harvest in a great measure depends upon the general degree of success with which the silk-worms have been hatched and bred. From three to five francs per quintal may be taken as including the average rate.

So much for the production of the food of the silk-worm. Let me now attempt some detail of the main points of the process of breeding the insect itself.

According to the progress of the mulberry tree is fixed the epoch at which the eggs of the silk-worm, carefully preserved during the winter in folded cloth, are vivified. In its minutiæ, the process observed differs in different districts, but the general mode of proceeding is the same. The cloth containing the ova is first soaked, the more easily to separate the eggs from their resting place, the former are then scraped off—frequently, in the Ardeche, by rubbing one portion of the texture against the other—and heaped in a basin into which clear water is poured. This detaches the eggs from each other, the stale or spoiled ones floating to the surface. Sometimes wine is poured over the good ones after they are taken from the basin. The next process is drying the eggs, usually taking about two days, spread either upon a bricken floor or *claies* of osiers. The eggs are now ready to be subjected to the warm temperature which hatches them. To manage this part of the process the rude expedient in some cases adopted is, as I have said, for the operator to go fairly to bed with the ova and hatch them by the natural heat of the body. Closets, well warmed by stoves, are, however, more often resorted to, and the eggs are ranged round in small boxes upon shelves. The insects make their appearance in from three to five days, more or less, according to the degree of heat kept up. The warmer the eggs have been kept during the winter, the more readily they vivify in spring. A common practice is to place sheets of paper, pierced with numerous holes, over the eggs, as they begin to show signs of life; through these holes the worms crawl up. Leaves of the mulberry, or small branches of the tree, are laid upon the paper, and to these the insects speedily attach themselves, beginning from

the very first to eat greedily. By the help of the twigs in question, they are carried to the *claies* prepared for them, in what I may properly call the breeding-room, and the "education" begins. The *claies* do not always consist of the split osiers I have described. In some of the best establishments well stretched sheets of canvas are used instead. At first a small space of *claie* or shelf-room only is required, but with each change of skin the quantity must be enormously increased. A silk-worm, during its brief life of little more than a month, increases in weight upwards of one thousand fold, four distinct skins bursting in the process, and being supplied by wider and roomier integuments. We are now, therefore, to suppose that the little newly-hatched creatures are distributed on their shelves, either fixed or immovable, in the breeding-room. The more easily to convey a definite idea of the space and the quantity of food required, we shall suppose that the breeder intends to rear the produce of five ounces of eggs—a quantity requiring a large atelier and a very considerable stock of mulberry leaves. The space at first allotted to the worms ought to be from 36 to 40 square feet. It is of importance that the creatures should not be crowded. The first day they consume four meals of leaves, the whole consisting of about 3¾ lbs. of the substance, selected from the tenderest and juiciest shoots of the tree, and cut very small. A space of six hours intervenes between the repasts, and as a general rule the quantity of each is to be successively augmented. The number of worms supposed to be now feeding is about 200,000; but great numbers die off, even under the most careful superintendence. Those who eat less than the average quantity become weakly, do not increase in size, and soon perish. Generally speaking, the worms devour their allowance of leaves in an hour and a half, and then lie almost motionless till the next meal. The second day the allowance is increased by one half—six pounds of leaves well cut up being served out to the insect guests. The third day the quantity is again doubled, that being one of the periods of their life when the insects eat voraciously. All this time it is to be noted that the attendants keep spreading the insects out more and more, removing the sickly or the dead, and watching the length of time the healthy take to eat; since, if the meals are devoured with more than average rapidity, a proportionately greater quantity of leaves must be supplied, and less time allowed to elapse between the repasts. The reader will thus have a notion of the continued, harassing, fidgety species of the work required. The neat light-handedness of women renders them generally more fitting than men for the task.

On the fourth day the appetite of the creatures falls off as suddenly as it augmented, and the allowance is diminished to between 6 and 7 pounds. The size of the worms has now visibly increased, and the attendants take great pains to keep them from overlying each other. I need hardly remark that at this, as well as at the latter stages, the atmosphere ought to be kept as pure as possible. Holes for ventilation are commonly established both in the floor and roof; and the fires which are kept constantly burning night and day tend to increase the activity of the circulation of the air. Still, however, in the rude country concerns, the atmospheric conditions necessary to perfect success are often neglected. A damp fungus-like smell broods in the dark interior, and, after their month of labour is over, the breeders come forth pale, emaciated and out of order. To continue. It is on the fourth day that the first symptoms of the first change of skin or *mue* become evident to the practised eye of an experienced "educator." The creatures keep moving their heads; and the skin, from its strained condition, takes a shiny appearance. Then the torpid state comes gradually on, and by evening many of the worms lie motionless, waiting for the change. On the fifth day, a very small quantity, about one pound and a half of leaves, is distributed in the vicinity of those worms who appear not to be so far gone as their companions. The exact proportion of food given must depend upon the requirements of the insects, ascertained by the close watchfulness of the attendants. In the night the change of skin frequently takes place, many of the worms appearing in their new garbs next morning. The creatures are now about four lines in length, and of a dark ashen colour. The next important process, and one which is repeated at each of the four changes, or commencements of ages, is to transfer the worms to fresh and larger beds—of course cleaning the couches which the animals have already occupied. There are different modes of accomplishing this process. One much in vogue is to spread branches of mulberry over the creatures, which cling and stick to them. The loaded twigs are transferred to little trays or platforms, the operation being conducted as gently as possible, in order to avoid hurting the insects, which are then deposited upon fresh leaf-strewn *claies*, and the twigs which served for their removal taken away. A newer and better method has, however, been adopted by a few of the most skilful breeders of the Ardeche. I saw the apparatus employed in the beautifully-fitted *magnannerie* of M. Giraud, the proprietor of the fine old feudal castle of Chateaubourg, one of the most striking objects upon the right bank of the Rhone in nearing Valence from Lyons. The contrivance consisted in sheets of pierced paste-board, fitted to the size of the *claies*. These, covered with leaves, are placed over the worms; the creatures climb to the upper surface, and are carried away, to be laid upon new *claies;* the process being repeated at the next age, while the sheets successively soiled, being thus deserted, are easily freshened and cleaned, and made fit for further use.

The first day of the second age the worms must be ranged upon a square, comprehending about 74 feet. A gentle movement of the head is the signal that they are up, stirring, and ready to resume their career of mulberry-leaf devouring. A meal is accordingly served out, after they have been about an hour and a half on their new shelves. During the day the creatures eat about nine pounds of leaves, and are usually brisk and lively in their movements. On the second day of the second age the allowance of leaves is increased at once to thirty pounds, administered as usual in four repasts, with six hours' interval between each; great care is taken that the quantity consumed by each worm shall be as nearly as possible equal. When an undue concourse of in-

sects to any particular point takes place, the surplusage is lifted upon twigs, and set down in more thinly inhabited parts of the *claie*. The third day of the second age the worms eat about 33lbs. of leaves. In the morning they are ravenous, and devour the greater proportion of the quantity. Towards evening their appetite falls rapidly off, and symptoms of torpidity begin again to appear, the worms lying listlessly upon the leaves, holding their heads erect, and refusing aliment. Next day—the fourth of the second age—9lbs. of leaves provide for the wants of those insects which have not already became torpid. During the day they fall asleep by thousands ; and, as in the case of the first change, they burst their skins for the most part in the night. The worms are now six lines in length. After the first change, 3,240 weighed an ounce. Now 610 suffice to balance the weight. As these changes take place the worms excrete more matter, and require more air, at a lower temperature. The ventilation, therefore, is or ought to be, carefully attended to.

Upon attaining the third age, the space to be allotted to the insects is about 174 square feet. It is a sign that they are thoroughly wakened up if they move their heads and bodies, in curiously undulating sweeps, when breathed or blown upon, The occurrence of this phenomenon is held to be the symptom of their entry upon the active period of their third age. The first day 15lbs. of leaves, and as many of tender young twigs, are supplied. The assistants now wear baskets suspended from their necks, containing the food which they distribute carefully over all the *claies*. During the day as much as 60lbs. of leaves are distributed, and the worms increase in size very fast, their dimensions becoming visibly greater every hour. The second day they eat 90lbs. of leaves, the greater proportion being given in the evening. The attendants must now be busy enlarging the space which the worms occupy, and separating each as much as possible from its fellow. The third day nearly 100lbs. of leaves are consumed, the greater quantity during the morning. Towards night the insects are relapsing again into their periodical time of stupor; but, sleeping or waking, their bulk continues to increase steadily. The fourth day 52lbs. of leaves suffice. By evening many of the insects are asleep; those which still show symptoms of a desire for food are fed, little by little, with sprinkled handfulls of leaves —a tedious and harassing operation. For the fifth day 27lbs. of leaves are necessary. On the sixth day all the worms are torpid. By this time, they have increased to the length of twelve lines, and small legs and claws have developed themselves. During the latter part of the third age, the pattering of their little claws upon the leaves, as the insects climb upon them to feed, can be distinctly heard. The noise has been compared to a fall of rain in a wood, and to the burning of young branches.

At the commencement of the fourth age, the worms require a square space of not less than four hundred and twelve feet, and the importance of fresh and pure air becomes greater from day to day. In some establishments the previous stages of life have been passed by the worms in a smaller atelier than the great one to which they are now removed ; but this plan is by no means needful, and is only resorted to by very scientific breeders who pay great attention to the atmospheric requirements of their charge. In general, the animals spin their cocoons upon the *claies*, and in the chamber to which they were transported from the hatching-room, while in many instances one single apartment only has been employed for the whole process. The worms eat on the first day of the fourth age about 100lbs. of leaves and tender branches. Their removal to their fresh *claies* employs several people, as it is of importance that the work should be well and speedily performed. In this age the leaf is given without being cut, as in the previous stages, and the worms are generally thriving, vigorous, and full of life, climbing actively upon the leaves. The skin of the creatures is gradually growing white. On the second day of the fourth age 165lbs. of leaves are given in unequal portions, the last meal being the largest. The next day 225lbs. of leaves are distributed, and the third day 255lbs., the three first repasts being about 75 lbs. weight each. The worms are now quite an inch and a half long. On the fifth day of the fourth age the appetite falls off, and only 128lbs. of leaves are distributed, the first meal being the greatest. Towards evening the worms have fallen for the most part asleep, and 35lbs. of leaves suffice for the few who feel in a lively condition next morning. The change of skin takes place as usual in the night, the insects being now so large that thirty-five of them weigh an ounce. Straw fires are lighted so as to produce great blaze with little heat, and other means are taken to stir and purify the air, as the worms are now undergoing their change to the fifth and last, and most important age. The ages already past are called *frezes, les petites frezes* ; the fifth is the *grande freze*, and upon the progress then made by the insects depends in a great measure the success of the breeding.

In the fifth age the worms are grown so large, and the quantity of food consumed is so great, that unless proper precautions be taken the air of the *magnannaries* becomes offensively putrid. In too many instances these precautions are either neglected or inefficiently observed, and the worms and their keepers both suffer the bad consequences. On the return of vitality a square place, of near 920 feet of *claies*, is necessary for the accommodation of the insects. I ought to observe that, in arranging them on their new beds, after each change of skin, they do not occupy the whole additional space at once. Room is left for spreading them out, as they wax thicker and longer, the creatures being generally arranged at each end of the *claie*, with a vacant space in the centre. On the first day of the fifth age the worms take, in twigs and leaves, about 180lbs. of food. The second day, at least 270lbs. are furnished, the last meal being the greatest. The worms are growing rapidly, and becoming white. The third day the mulberry allowance is 420lbs.—the last meal consisting of about 120 lbs. Many of the insects are now 26 or 27 lines long. The next day they consume about 540lbs. of leaves, waxing strong and vigorous, and the length increasing to 32 or 33 lines. The fifth day sees 810 lbs. of leaves devoured. besides which small extra allowances are frequently

given if the animals seem unsatisfied. The next day the worms attain the height of their degustatory prowess, eating very nearly 1,000 lbs. of leaves, spread over fixe or six meals. Many of them are now more than 2 inches in length. The seventh day 900 lbs. of leaves are given—the quantity at each meal decreasing. On this day the creatures attain their greatest size and vigour—sixteen worms weighing an ounce ; their weight having in seven days increased five-fold, and their length become at least double. The eighth day they require only 660 lbs. of food. They are now going down hill in appetite, weight and vigour, and are assuming a yellowish tinge, which denotes the approach of perfect maturity. The ninth day 500 lbs. of food suffices. On the tenth day the insects commonly show symptoms of desire to weave their cocoons. They climb upon the leaves without eating, move their heads as though seeking something, and begin to crawl towards all perpendicular surfaces. The *claies* upon which the cocoons are spun have then to be set up. I have already explained, in general terms, that they consist of furzy branches of small twigs, arranged upright between the *claies*, so that the worms can easily climb into them. The skill of the attendant is shown in arranging the *claies* so as to cause them to be as slight an obstruction to the ventilation as possible. The meals are now greatly reduced. Over feeding has a tendency to retard the desire to mount the *claies*. Twigs and small sticks are now scattered all along the *claies*, so that the worms crawling upon them are easily distinguished, and are moved at once to the bottom of the brushwood rows. As a general rule, healthy worms finish their cocoons in three or four days after they have set fairly to work ; but in general the task of gathering does not commence until the eighth or ninth day after the insects have begun to climb. In large establishments several hands are usually employed in the task. Of the whole quantity of cocoons about the sixtieth part is kept for the sake of the eggs for next year. A pound of cocoons gives an ounce of eggs—in some cases even more. These are, of course, kept till the chrysalis makes its way in his new butterfly dress through the gnawn silk. The creatures are for the most part too weak to fly, and after the female has been impregnated, and has deposited her eggs upon cloth spread out for the purpose, the brief but useful life of the longest surviving silkworm is over. The others have been stifled in the cocoons, and their silken web spun off from around them.

The rules of feeding which I have given above are those observed by the most successful breeders of Italy and France. It will be readily seen that the exact weights of food adduced are slightly added to or diminished according to the varying circumstances of each particular case. The general result, however, as to the quantity of food and the quantity of silk, may be thus stated : about 100 lbs. of leaf give nearly 8 lbs. of cocoons ; 8 lbs. of cocoons give about 18 ounces of pure cocoons, deducting the worm and all impurities ; and these 18 ounces of pure cocoons give about 8 ounces of spun silk. The proportion of the weight of the cocoon to that of the leaf is thus about 1 to 90 ; the proportion of the spun silk to the weight of the leaf about 1 to 150. The price of cocoons range per pound from 2 francs to 2½ francs.

In the breeding of silkworms the metayer system is not uncommon : the farmer finds the work, and the proprietor the leaves—the two dividing the proceeds. France annually produces about 8,000,000 kilogrammes of raw silk; and of her 84 departments, as many as 60 grow mulberries, to a greater or less extent, for the use of the silkworms bred within them.

ANIMAL INSTINCT.—Can insects talk ? This may indeed seem a strange question to those who would limit the meaning of the word to the capability of expressing ideas by means of articulate sounds ; nevertheless a little reflection will convince any one who is conversant with the habits of these creatures that, though they may have no tongues, they can express themselves in some way or other, 'with most miraculous organ.' Various experiments might be quoted in proof of this assertion ; let us, however, select one or two which seem to leave no room for dispute about the matter. Any one who finds himself in the vicinity of an ants' nest may soon be convinced that these industrious little labourers are by no means destitute of the power of communicating information to each other relative to the affairs of their commonwealth. Let him, for example, place a heap of food in the neighbourhood of the ant-hill, and watch the proceedings of its inmates. A short time will probably elapse before the discovery of the treasure, but at length some wanderer, in his morning's ramble, has the good fortune to stumble upon it. What does he do ? He does not, like an isolated individual incapable of asking for assistance, begin at once the task of re-removing the heap, but on the contrary, off he scampers with the glad intelligence, and running his head against that of every ant he meets, manages in some mysterious way, not only to intimate the fact of the discovery, but also to give information relative to the locality where the provisions may be found, for speedily it will be seen that troops of porters, summoned at the call of the first finder, hasten to the spot, and all is activity and bustle until the store is safely warehoused in the ant-hill. Another still more striking instance of the possession of a capability of spreading intelligence, and that of a somewhat abstruse character, is furnished by experiments that have been made by Huber and others upon bees. Every one is aware that the queen-bee is an object of the greatest solicitude and attention to all the workers of the hive, and yet, among so many thousands, all busily employed in different and distant parts of the colony, it would appear impossible for them to ascertain, at least before the lapse of a considerable time, whether she was absent from among them or not. In order to see whether bees had any power of conveying news of this kind, the queen-bee has been stealthily and quietly abstracted from the hive ; but here, as elsewhere, ill news was found to fly apace. For some half-hour or so the loss seemed not to have been ascertained, but the progressively-increasing buzz of agitation gradually announced the growing alarm, until shortly the whole hive was in an uproar, and all its busy occupants were seen pouring forth their legions in search of their lost monarch, or eager to avenge with their stings the insult offered to their sovereign. On restoring the captured queen to her subjects, with equal secrecy, the tumult speedily subsided, and the ordinary business of the community was resumed, as before the occurrence.—*Nat. Hist.*

ABSTRACT OF AGRICULTURAL CENSUS OF CANADA, 1851.

UPPER CANADA.

The total number of acres of land held in Canada West is 9,823,233, of which are under cultivation 3,697,724, under crop 2,274,586, in pasture 1,367,649, gardens 55,489, wild land 6,125,509. There are cropped in wheat 782,115 acres, and the produce is 12,692,852 bushels. The county which possesses the largest number of occupied acres is York, with 390,525; the same county has likewise the largest number of acres in wheat, viz., 50,147, producing 991,608 bushels. The smallest number of acres in wheat is the county of Bruce, where only 489 acres are cultivated for this crop; but as these acres produce 9,796 bushels, or an average of 20.3 bushels per acre, Bruce has the honour of being by a trifle the most fertile wheat county in the Province; York comes next, with an average of 19.71 bushels per acre; and Brant, Durham, Halton, Huron, Oxford, Stormont, and Wentworth, all show a product either within a fraction more or less of 19 bushels to the acre. The county which exhibits the smallest average per acre is Lennox, with 5,046 acres, producing 30,281 bushels, little more than 6 bushels to the acre. The average for the whole of Upper Canada is 14.90 bushels per acre.

The total number of occupiers is 99,860, of whom 3,080 held more than 200 acres, 18,421 from 100 to 200 acres, 48,027 from 50 to 100 acres, 18,467 from 20 to 50 acres, 1,889 from 10 to 20 acres, and 9,976 10 acres or under. By far the largest number of holdings, therefore, are those of parcels between 50 and 100 acres.

The following are the statistics of crops other than wheat for the whole of Upper Canada:—Barley, 29,916 acres, 625,875 bushels—20.98 bushels per acre; rye, 38,968 acres, 479,651 bushels—12.34 bushels per acre; peas, 192,109 acres, 2,873,394 bushels—14,9 bushels per acre; oats, 421,684 acres, 11,193,844 bushels—26.54 bushels per acre; buckwheat, 44,265 acres, 639,384 bushels—14.51 bushels per acre; Indian corn, 70,571 acres, 1,696,513 bush.—24.05 bushels per acre; potatoes, 77,672 acres, 4,989,475 bushels—64 bushels per acre; turnips, 17,135 acres, 3,644,942 bushels—212.72 bushels per acre.

The following is returned as the gross produce in other crops:—Clover and all grass seeds, 42,460 bush.; carrots, 174,895 bush.; mangold wurtzel, 54,226 bush.; beans, 18,109 bush.; hops, 113,064 lbs.; hay, 681,782 tons; flax or hemp, 50,650 lbs.; tobacco, 764,476 lbs.; wool, 2,699,964 lbs.; maple sugar, 3,581,505 lbs.; cider, 701,612 gallons; fulled cloth, 527,466 yards; linen, 14,958 yards; flannel, 1,169,301 yards.

The following is the census of cattle:—Bulls, oxen, or steers, 193,982; milch cows, 296,924; calves or heifers, 254,988; horses, 203,300; sheep, 968,022; pigs, 569,237.

Produce of cattle, viz.:—Butter, 15,976,315 lbs.; cheese, 2,226,776 lbs.; beef, 817,746 barrels; pork, 528,129 barrels. And 47,589 barrels of fish were cured.

LOWER CANADA.

The whole number of acres held in Canada East is 8,113,915. Of these are under cultivation 3,605,317, under crop 2,072,953, under pasture 1,508,355, gardens 30,209, wood or wild land 4,508,398. There are cropped in wheat 427,111 acres, which produced 3,075,868 bushels.

The county which possesses the largest quantity of cultivated land is Dorchester, with 479,712 acres; and that with the greatest quantity of wheat is Huntington, with 40,229 acres, and 241,171 bushels; the smallest number of cultivated acres are in Gaspe, viz., 92,210, producing also the smallest quantity of wheat, or 641 acres, and 3,418 bushels. Stanstead grows most wheat to the acre of any county of Lower Canada, having 4,851 acres in wheat, and 62,882 bushels—12.96 bushels per acre; the county producing the smallest quantity per acre is L'Islet, from which the return is 15,531 acres, 67,912 bushels, or 4.38 bushels per acre; after Stanstead, Missisquoi and Sherbrooke are the most fertile counties in wheat, both producing more than 12.5 bushels per acre. The total production of wheat in Lower Canada is 427,111 acres, and 3,075,868 bushels—7.2 bushels per acre.

The total number of occupiers of land is 94,449; of these 4,585 hold more than 200 acres; 18,608 more than 100 acres, 37,885 from 50 to 100 acres, 2,701 from 20 to 50 acres, and 13,261 10 acres and under; the largest number of occupiers, therefore, are those of from 50 to 100 acres.

The following are the statistics of crops, other than wheat, for Lower Canada:—Barley, 42,927 acres, 668,626 bushels—15 bushels per acre; rye, 46,007 acres, 341,443 bushels—7.87 bushels per acre; peas, 165,192 acres, 1,182,190 bushels—7.16 bushels per acre; oats, 590,422 acres, 8,967,594 bushels—15 bush. per acre; buckwheat, 51,781 acres, 530,417 bushels—10.24 bushels per acre; Indian corn, 22,669 acres, 400,287 bushels—17.69 bushels per acre; potatoes, 73,244 acres, 4,456,111 bushels—60.08 bushels per acre; turnips, 3,897 acres, 369,909 bushels—95 bushels, per acre.

The following is returned as the gross produce in other crops:—Clover and all hay seeds, 18,921 bush.; carrots, 82,338 bush.; mangold wurzel, 103,999 bush.; beans, 23,602 bush.; hops, 111,158 lbs.; hay, 965,653 tons; flax or hemp, 1,867,016 lbs.; tobacco, 488,652 lbs.; wool, 1,430,976 lbs.; maple sugar, 6,190,694 lbs.; cider, 53,297 gals.; fulled cloth, 780,891 yards; linen, 887,528 yards; flannel, 860,850 yards.

The following is the census of cattle, &c., viz.:—Bulls, oxen, or steers, 111,819; milch cows, 294,514; calves or heifers, 180,317; horses, 236,077; sheep, 629,827;

pigs, 256,219; butter, 9,637,152 lbs.; cheese, 511,014 lbs.; beef, 68,747 brls.; fish, cured, 48,363.

Dorchester grew the most barley, viz., 190,799 bush.; Reinonski most rye, 56,304 bush.; Huntingdon most peas, 127,083 bush.; Berthier most oats, 665,509 bush.; Sherbrooke most buckwheat, 64,589 bush.; Missisquoi most Indian corn, 42,394 bush.; Montreal most potatoes, 310,598 bush.; Portneuf most hay, 56,763 tons; Berthier most flax or hemp, 92,407 lbs.; and most tobacco, 67,174 lbs.; Beauharnois most wool, 74,354 lbs.; Sherbrooke most maple sugar, 421,932 lbs.

The greatest number of bulls, oxen, and steers are in Dorchester, viz., 9,274; also of milch cows, 16,102; and of horses, 60,436; and of sheep, 36,416; Beauharnois most calves, 11,204; and most pigs, 14,378; and the greatest quantity of butter, 946,371 lbs., the next largest county making only 594,817 lbs.; Missisquoi carries the palm in cheese, making 190,788 lbs.; Stanstead packs most beef, 31,432 brls.; Reinonski most pork, 66,794 brls.

COMPARATIVE RECAPITULATION.

	Upper Canada.	Lower Canada.
	Acres.	Acres.
Lands occupied	9,823,232	8 113,915
Lands cultivated	3,677,724	3,603,317
Lands cropped	2,274,586	2,072,953
Pasture	1,364,649	1,502,355
Gardens	55,489	30,209
Wild lands	6,125,509	4,508,398
Acres in wheat	782,115	427,111
	Bush.	Bush.
Wheat	12,692,952	3,075,858
per acre	14 90	7·20
Wheat in best county		
per acre	20·30	12·96
Barley	625,875	668,626
per acre	20·98	15
Rye	479,651	341,343
per acre	12·31	7·87

	Upper Canada.	Lower Canada.
	Bush.	Bush.
Peas	2,873,294	1,182,190
per acre	14·90	7·16
Oats	11,193,844	8,967,594
per acre	26·54	15
Buckwheat	639,384	530,417
per acre	14·51	10·20
Indian Corn	1,696,513	460,287
per acre	24·05	17 60
Potatoes	4,981,475	4,456,111
per acre	64	60 08
Turnips	3,644,942	389,909
per acre	212	95
Grass	42,460	18,921
Carrots	174,895	82,338
Mangold Wurzel	54,226	103,990
Beans	18,109	26,302
	Tons.	Tons.
Hay	681,782	965,633
	Lbs.	Lbs.
Butter	15,976 315	9,637,152
Hops	113,064	111,158
Cheese	2,226,776	511,054
Flax and Hemp	50,654	1,867,016
Tobacco	764,476	488,652
Wool	2,699,964	1,430 976
Maple Sugar	3,581,505	6,190,694
	Yards.	Yards.
Fulled Cloth	527.466	780,891
Linen	14,955	889,528
Flannel	1,169,301	860,850
	Head.	Head.
Bulls, &c.	139,932	111,819
Milch Cows	296,924	294 514
Calves and Heifers	254,988	180,317
Horses	203,300	236,827
Sheep	968,022	629,827
Pigs	569,237	256,219

It must be remembered that throughout the greater part of Lower Canada the acres are arpents and the bushels menots. An arpent is about one-seventh less than an acre, and a menot about one-eighth more than a bushel.—Montreal Herald.

FARMING NEAR THE GOLD FIELDS.

The *Carlisle Patriot* publishes the following letter, dated Glassonby, near Kineton, Mount Macedon, Victoria, Australia, from Mr. John Palmer:—

"We have had splendid health since we came to this colony, and both myself and family are in good health at the time I am writing this. We are all abundantly thankful that we are in this plentiful land, where there need be no want with proper care and endeavour. Here is the place where the industrious are rewarded for their toil. There are no taxes, no tithes to pay, and every one is as free as the air he breathes. I would not return to England for the two best estates in Glassonby, that is, to be tied to live on them, and leave this colony for ever—not that I am boasting of my riches. It has been all outlay since I came here. The first thing I had to do was to buy land; then to build a house, and the land to fence; then the timber to clear off it. The clearing and fencing cost 30s. an acre. I have now 60 acres cleared, and 24 in crop. It is my intention to have 80 acres in crop next year, 60 acres of wheat and 20 of oats and potatoes. Considering it my duty to give you some information respecting this colony, I intend to write the truth as nearly as it is possible. I will first give you information regarding agriculture. Farmers here plough and sow six or eight years in succession without any management, and get very good crops. The land then gets dirty, when they take a fresh lot and break it up, the other lying without sowing any seeds. The land produces two crops of oats with once ploughing and sowing. The farmers never think of summer-working the land. Potatoes are planted without any manure, and produce very good crops. The average price of grain is from 4s. to 6s. per bushel: wheat sells at that; but this season it is from 6s. to 12s., on account of being to much injured by droughty weather; 3s. and 5s. have been the average prices for summer oats, but they have risen to 8s. and 9s., everything being very high on account of the gold diggings. Labourers cannot be got under 10s. per day; they are all off to the gold mines. I will now give you information on the subject of grazing—what is called here 'squatting.' There are squatters that hold from 20 to 60 square miles for their sheep run; they pay a license to Government of £10 per year, also 0½d. per head for sheep, 1d. for cat-

tle, and 1½d. for horses. They never account for near the quantity of stock they have on their runs. It is a profitable game. Their profits are from £1,000 to £9,000. yearly. Some of them have as many as 40,000 sheep and 3,000 to 5,000 head of cattle and a great many horses. Many of the squatters that were not worth £1 when they landed in the colony eight or ten years ago, are now in possession of £30,000 to £40,000. The stations were obtainable on favourable terms at that time. Many have sold the good-will of the run, with their stock of sheep, and returned to England independent. Men that were only servants when their masters failed nine years ago—stock rising to such a high price and then falling again, causing their failure — received from Government in lieu of the wages due to them the stations of their former employers, with the sheep thereon at 1s. a-head, and in this way were raised to great importance and wealth. We have now got a colonial Legislature, and it is expected that there will be an alteration made in the squatting regulations, as an extensive emigration is looked for from England on account of the gold discoveries. These are the richest gold mines in the world. At the time I am writing there are about 20,000 diggers at Mount Alexander, only 18 miles from where I live. The diggers seldom make less than from £40 to £60 per week, but I am sorry ro say that two-thirds of them are doing themselves harm both in body and soul; there are, however, some, although a smaller proportion, who take care of their earnings. Four of my sons have been two months at the diggings, and have got me £1,000 sterling of the precious metal. Merchants, mechanics, and men of all occupations, are now at the gold mines. The large towns are almost deserted; every one is searching for this precious metal. There is gold in abundance all over the colony. There are many places where they are digging for gold besides Mount Alexander in the Victoria colony, but none more rich than Ballarat, about 40 miles from my residence. There are two Government escorts that run from the mines at Mount Alexander to Melbourne once a week with gold. This week they took 28 cwt. The escort being overladen, on meeting the mail from Melbourne, they were obliged to be assisted with the mail horses. My daughter Margaret was coming by the mail at the time, and was an eye witness of this. There is much gold sent by private hands; many take their own to Melbourne and Geelong. There are a number of gold jobbers to buy it at the mines and sell it in the towns, and in this way make good profits. The diggers are protected by police stationed at the diggings. A guard of nine mounted troopers accompany each escort to the town; they are all armed to the teeth. A good many diggers generally go down with the escort, with their own gold, on good horses, and armed with rifles. The diggers pay 30s. a-month to the Government for licenses and protection. I will now leave the gold subject, and give you information on some other things. I can truly say that this is the best country under the sun for the industrious labourer. It is a pity there are not thousands of such here, as there is plenty of employment and good wages. This is the land where no one need repent coming to. Every one may do well if they try, and are steady. I don't mean to say that every one without exception will get riches, but their industry will be well rewarded. I often do say, it is such a pity that so many are starving in England. Here there are many thousands of sheep and cattle boiled down merely for their tallow, as there are no mouths to eat them. I cannot give you so just an account as I like of mechanics' and labourers' wages at the present time, for they are all gone to seek gold, but any that are employed at their own trade are getting 20s. per day. Blacksmiths get 20s. for shoeing a horse, and other trades get money in the same proportion. It is besides the finest climate in the world, neither extremely hot nor extremely cold, and good land in abundance, and very cheap. Rather than be pinched in England, come here, and the sooner the better. I do not rue having done so. We are £1,000 better than the day we left England; many may dispute this, but it is a fact. The *bona fide* cash is in the bank to buy land with at the first Government land sale. I have now 200 acres of good land, which I purchased soon after I landed. A man emigrating here with a strong family, steady, and industrious in their habits, if he has not one shilling when he arrives, is better off than the man with £1,000 in his pocket with no family, or one so young that he has all to hire. Under such circumstances he is soon a £1,000 out. Any man, with such a family as I have, be he who he may, may consider himself worth £1,000 the day he lands in this colony. There is an Irishman whom I am acquainted with, who landed here four years ago, with nothing but a family of nine children; this same man I saw at the last Government sale wanting to buy 300 or 400 acres of land. He told me he had saved £500 since he landed. I must tell you that a dairy is a good thing here. I milk 14 cows at present, and I intend to increase the number to 20 or 30. We sell all our butter at 2s. per lb., and I have had 1s. 3d. per lb. bid for all the cheese I have; but I refused it, as I can get a good deal more. I know you people in England will dispute this, but I write the truth. I am living 55 miles from Melbourne, 1 mile from Kyneton, a town of ten months' standing, with a population of 400 inhabitants. The military road to Melbourne comes close past my house, so you see I have an opportunity of seeing all the traffic to and from the mines. In comparison, the roads day by day are thronged the same as one of yours on a market day. I am about to send to England a quantity of gold to the amount of £700 to get coined into sovereigns. We put the gold into the Bank, when they advance 40s. per ounce upon it until the coin returns from England. Four of my sons obtained this in six weeks at Mount Alexander. I remember you once saying to me, near 'Long Meg,' that you would never go out to any colony to get riches, as you would be sure to be disappointed. My answer was, Neither would I, but I think it will be better for my family. I never, however, thought of getting gold in pound weights. I have much reason to praise and be thankful to God for providentially moving me and my family to come to this land of plenty. We can do with tens of thousands; there is bread enough and to spare. Do your utmost to induce your honest, well disposed, and industrious labourers to

come out here. If they have not one farthing left when they arrive the days of their poverty are passed. You farmers who are losing your money in England, come here and redeem your condition. John M—— would do well here, and every man in his circumstances. His family would be fresher and more vigorous on landing on these beautiful shores. Do not be afraid of the voyage, as it is the very best navigation, and the Almighty is God of the seas as well as the land. Let a good ship be chosen, and there is not much to fear. I always respect and remember you with gratitude ever since you set your shoulder to me as my friend. T. Glenton and yourself, I acknowledge, were friends in need. If you can be the means of persuading any of your industrious poor to emigrate to this distant colony, it will be a blessing both to them and yourself. The harvest is now ripe; and the crops are abundant. I must not omit telling you that there are all sorts of religious societies here, the same as in England. You can worship under your own vine and figtree. I promised to send H. Richardson a letter, but I have not done so. Let him see this, and any one else you think proper.

"I do conclude with a great desire to see as many come here as can manage to do so, that they may prove for themselves the statements I have made in this letter. I am conscious that I have written nothing but the truth. God forbid that I should unduly boast of that success and good fortune with which it has pleased the Lord to bless me."

REPORT UPON THE POTATO DISEASE AND ITS CURE BY DRESSING THE SEED BEFORE PLANTING.

To the Council of the Royal Ayricultural Improvement Society of Ireland.

The Secretary reported that having had a call from Mr. George Eaton, gardener to Sir Thomas Butler, Bart., of Ballintemple, county Carlow, and heard the former explain in detail a variety of experiments in growing potatoes, whereby Eaton stated he had discovered a mode of growing perfectly healthy tubers, he addressed a note to Sir Thomas Butler on the subject, and received a reply stating that Eaton had succeeded in so dressing and planting his potato seed as to grow ound crops of good quality, and that "this year, although the crop in the fields of Ballintemple is injured to nearly the extent of one-half, and not a field in the neighbourhood has escaped without considerable injury, I can safely assert, that in about one rood of ground which has been planted in the garden not a solitary plant has been affected."

The matter being one of national importance, and the hon. baronet, who advised Mr. Geo. Eaton to apply to this office, having vouched for the fact of perfectly good and healthy potatoes, being grown by Mr. Eaton in Sir Thomas Butler's gardens, I considered it my duty to make a preliminary investigation of the grower's case, and to report thereupon to the council as follows:—

1. Mr. George Eaton explains that he was in the employment of the late Countess of Belvedere for seven years as land steward and gardener, during which time he obtained seventeen prizes from the Westmeath Horticultural Society, at its meetings held in Mullingar; some of these prizes being given for the best early potatoes.

He afterwards lived in the service of the Right Hon. the Earl of Meath, during which time he was awarded at the Royal Dublin Society's Show two medals for the best sample of Indian corn grown by him.

He left Lord Meath's service in April, 1849. In September thereafter he went to a Mr. Dawson, of Cullamore, where he was till January, 1850, when he went to Sir Thomas Butler, and with whom he has been till lately.

2. Mr. Eaton explains that subsequent to the violent attack of the potato disease in 1845, he was doubly careful in *greening, preserving, and selecting* the seed for his crops, but still they failed to a large extent. But it occurring to him that the virus of the disorganisation either proceeded from small insects which he saw in the roots of the plants, or that these injurious insects resulted from a deleterious fluid or substance in the tuber, which was foreign or opposed to the plant's healthy development, he (Eaton) bethought himself of applying a compound dressing of certain substances to the potato tubers when cut for planting, in order to ascertain, if possible, whether such deleterious fluid or injurious insects were the cause or effect of that vegetable disorganisatiou which precedes or follows from the potato disease.

Accordingly, in 1848, he took some potato seed, purchased from Mr. O'Farrell, seedsman, Dublin, and sowed the same in a melon bed, in the month of April. The seed sprouted, and the plants grew up vigorously till about the middle of July, when they were blighted in a single night. Eaton then took up the plants, and cut them down to about four or five inches in length. The one-half of them he planted upon a garden border, and the other portion he replanted in the melon bed. The latter he dressed with his composition before setting. These grew vigorously, and were taken up in November, the tubers being the size of hen-eggs, and perfectly sound. Those plants which had not been dressed with the composition were taken up at the same time, and were found to be generally diseased, many rotten.

The next experiment he made in February, 1851, by cutting large seed, applying to it two dressings of his compound, then planting. At the same time he planted similar seed alongside of the dressed potatoes. When the dressed ones came to maturity, they were all sound and of excellent quality. Their haulms were vigorous and healthy all along, showing at no time any symptom of blight, and only colouring from the fading process inseparable from the ripening of the tuber. The others, which had not been dressed with the compound, but were planted alongside of the dressed ones, showed the disease upon the stalks at an early stage, getting worse and worse; and when the tubers were taken up they were much diseased.

In order to satisfy his mind that his system was not an exceptional case, but might be held to apply generally in the preparation of seed, so as to avert the potato disease, Geo. Eaton, in February, 1852, planted potato seed cut, dressed, and undressed, exactly as in the experiment and process described above, as gone through in 1851. Those grown from the seed dressed with the compound were all sound in haulm and tubers, above explained in the experiment of 1851. The potatoes now on the council table are the roots so grown from

pressed seed; and judging from the healthy streaky texture of the skin, and the depth of the eye of the tuber, no potatoes seen by me since the first appearance of blight seem so vigorous and safe to be used as seed; but whether they would grow perfectly healthy without being dressed with Mr. Eaton's compound is very doubtful. He says, that in the experiments of 1851 and 1852 the dressed and undressed seed was set plot beside plot, and that while the haulm of the compound dressed seed grew always healthy and the tubers sound, the seed which had not been prepared with the compound produced haulms and tubers (alongside of the others) affected and diseased in the same manner as the ordinary crops of the country.

Mr. Eaton states that his preparation and application would not increase the price of seed potatoes more than 10s. per acre, if quite so much.

A few hours after the dressing is applied the cut seed emit, a thickish dark-coloured fluid, which has a most disagreeable stench.

He has experimented successfully upon Beldrum, Pink-eyes, Bangers, and Ox-nobles, and will undertake to extract the deleterious matter from any kind of potato.

September, 1852. THOS. HARKNESS, Secretary.
—Irish Agriculturist.

GUANO AND THE ROT.

SIR,—While guano is occupying so much attention, with respect to cost and supply, the Lobos Islands, and cheap importation, and adulteration for the purpose of deceptive cheapness, are we careful to make the best of what we now import genuine?

We know how strong it is; how dangerous to touch or come near the seed in drilling; how much dilution it requires for liquid manure; and do we reduce it enough in common use?

No doubt it is very effective, as now used; but does it do no harm as well as good? It is the strongest animal manure concentrated by drying and full of ammonia. Dung is chiefly vegetable, seldom containing 1 per cent. of ammonia, and this thoroughly diffused through the mass. Guano contains 16 per cent, and when mixed with three or four times its bulk of reducing substance, still contains 4 per cent. ammonia, *only* mixed, not thoroughly diffused.

Since we have employed it, the rot has attacked, not potatoes only; but potatoes rot more with it than with cattle dung; and the potato plant is quickly blighted in guano vapour.

Other reasons are assigned for the rot; and this may not be the chief; but will it not be safer and more economical to reduce it much more, and with vegetable matter, where convenient, to assimilate it to yard dung? Many cases are on record, where the mixture of guano with farm dung has answered better than either alone. Would it not even be better composted, where the ammonia would be thoroughly diffused, and a more nourishing and less exciting food supplied to the plant? All these mixtures should of course be made on the farm; the portability of guano being one of its chief recommendations.

I have generally recommended *salt* to be mixed with guano, weight for weight; salt tending to counteract putrefaction and overgrowth; and in wheat, to strengthen the straw, and make the grain clean and heavy. Fishery salt, or other animal-foul salt is to be preferred; and I believe this mixture would also be the better for composting with sods and vegetable matter.

For drilling, charcoal powder is probably the best admixture —peat charcoal, tan charcoal, lime charred saw dust; or even charred (not ash burnt) clay, or cindery coal ashes; not less than six or eight times the bulk of the guano—and all the better for lying together damp five or six weeks before being used.

My argument in short is, that guano is likely to go further, do more good, and less harm, if generally mixed with an equal weight of salt, and reduced by eight or more times its bulk of other materials; allowed to lie together damp some weeks; and when convenient, composted with dung and the other customary substances. I. PRIDEAUX.

IMPORTANT DECISION.—THE LAW OF FIXTURES.

COURT OF BANKRUPTCY, OCT. 29.

Before Mr. Commissioner Fonblanque.

IN RE WOOD.—His Honour delivered the following important judgment on the law of fixtures. He said: Since the matter was last before him he had very carefully consulted all the cases cited in the course of the arguments, not only so far as they might turn out to be necessary to the decision of the question now before him, but also as a matter of curiosity to trace, if possible, the source of so much difference of opinion, and so much diversity of judgment. He thought the source of diversity was to be found in the efforts of the law to adapt itself to the progress and exigences of society. In early times the maxim of *cujus est solum ejus est usque ad cœlum*, borrowed from the Roman law, prevailed without dispute; land alone was regarded—land alone was called real, and mere personals were considered, as they really then were, of little moment, as they were of little comparative amount. It was for this reason that, as Lord Kenyon says, in Penton and Roberts, quoted by the then Chief Justice Erskine in ex parte Lloyd, "The old cases on this subject leant to consider as realty whatever was annexed to the freehold by the occupier; but in modern times the leaning has always been the other way, in favour of the tenants, in support of the interests of trade, which has become the pillar of the State." If this was true in the time of Lord Kenyon, it must have acquired additional force in the course of the last half century, when the advance of commerce and the use of experience and complicated machinery in every branch of manufacture have rendered this protection so essential to the interests of trade, that if the courts had been unable to find a remedy the legislature must have been called on for its interference. Upon examination of the case before him, he found it more simple than he had at first anticipated. Divers articles were found in the bankrupt's possession at the time of the bankruptcy. He was a brewer, and these articles were called brewers' plant and brewers' fixtures. And here he might observe, that much of the confusion of the cases had arisen from the popular use of the word fixture, without discriminating between the degrees of annexation, varying from the solidity of a stone foundation to the tacking of a carpet or the hanging of a picture. The true question was, were they goods and chattels?—for to goods and chattels only does the statute of James and the subsequent statute derived from it apply, in its enactment as to order and disposition. Nor is this statute singular in this limitation: only goods and chattels could be taken in execution, only goods and chattels could be distrained. And under both forms such articles as the greater part of those now in question had been taken—with this exception, that under a distress, while the law required that the goods should be removed from the premises, only such could be taken as could be returned on replevy in the same state. In

questions between heir and executor such articles also had been held to pass to the executor as personalty, and not to the heir as realty. For each of these purposes, therefore, the articles were held to be goods and chattels. Why, then, were they not to be so held as between the mortgagee and assignee of a bankrupt's estate, he (the Commissioner) confessed that he was unable to discover either in reason or equity. I see every reason (continued the learned Commissioner) to prefer the doctrine, that what is in the bankrupt's open possession by the apparent ownership of which he obtains credit of the trading world, shall pass to the benefit of all his creditors, rather than to one only, who, by means of a private or secret conveyance, has obtained a preference over them. As to what is strictly realty, this is unavoidable; since the right to the realty beyond this necessity, and in all doubtful cases, I believe the Courts will lean, as Lord Kenyon says they have leant, in favour of creditors, and for the interests of trade. It is singular, however, that, in the diversity of opinion which has prevailed on this subject the decisions of the Court of Bankruptcy should be less favourable to creditors than those of the courts of common law. With the exception of Sir George Rose, whose judgment in ex parte Austin I shall have occasion to quote, the judges of the Court of Review seem to have been inclined to favour the mortgagee; while the courts at Westminster, from the case of Horne v. Baker to that of Halliwell v. Eastwood, have laid down principles which must necessarily lead to a contrary conclusion. Amongst those cases, that of Trapper v. Hartar (3 Tyrr. 603) is one of the most important. It was decided by Lord Lyndhurst, after he had been Lord Chancellor, and therefore when the law of bankruptcy was more familiar to him than it might be to other judges less frequently called upon to determine questions of this nature. This case determined that all utensils and machinery erected for the purposes of trade, and which could be removed without material injury to the inheritance, form an exception to the general rule as to fixtures, and are not to be taken as part of the inheritance, but as personal estate. This judgment is said to have been doubted by Baron Parke; but whatever respect might have been due to a doubt from such a quarter, the doubt itself is removed by the fact that the learned baron has concurred in the judgment of Halliwell v. Eastwood. Another judgment has also been set up by this case. It is that in ex parte Austin, in which Sir George Rose said, "I have no hesitation in saying that when fixtures are capable of removal, as between landlord and tenant, without injury to the freehold, they are within the order and disposition of the bankrupt." The soundness of this doctrine having been questioned, Sir George Rose, in ex parte Wilson, expressed his adherence to that opinion, which now appears to be fully confirmed by the Court of Exchequer. I must, therefore, come to the conclusion:— 1. That such articles as merely rest on the soil by their own weight, however heavy, are goods and chattels. 2. That if they are slightly connected one with another, and ultimately with the freehold, yet may be severed without material injury to the freehold, they follow the same rule. 3. That articles, though themselves fixed to the freehold by bolts and screws, or nails, or pegs, or other similar contrivances, are also goods and chattels. 4. That articles mainly sunk in the soil, or built on it, are of the realty, and do not pass to the assignees. I may take this opportunity to state that I do not consider the judgment of my brother Commissioner Holroyd, in the Vauxhall case, at all affected by my present judgment. In that case there was this material distinction, that the fixtures had been originally annexed to the freehold by the freeholder, and had therefore by unity of title, become one freehold property, and in that form they were demised to Hughes, the party who became bankrupt. Then as to the question whether new things, newly fixed, also passed; that, I think, must have very much depended upon the peculiar nature of the property, where, in order to fit up the place for a public exhibition, continual changes were necessary; and therefore, as some of the old were removed, it was equitable that the new should be fixed with the same rights as those that were removed. In a case before Mr. Commissioner Goulburn the same principle as that I have laid down has been adopted. And I think it may now be considered as the doctrine of this Court, in broad terms, that such things as can be removed without material injury to the freehold are goods and chattels, and pass to the assignees.

Mr. Commissioner Goulburn, who was also on the bench, said he fully concurred in the judgment that had been delivered by his learned brother Commissioner. Having himself been in consultation with Mr. Commissioner Evans on a similar case, he knew that that learned Commissioner took the same view of the question.—*From the Morning Chronicle of October* 30.

CALENDAR OF HORTICULTURE.

Plant Houses.

Conservatory.—Continue to make this house the centre of attraction, by bringing into it all the flowering plants from the subservient structures, which will bear the temperature and air to which it must be subjected, for the welfare of the permanent plants. It is not advisable to keep any (but particularly hard wooded) plants which require to be kept positively dormant, in this structure. The greenhouse will be found the best place for most kinds. A few which require a similar treatment to Heaths may be placed in that structure; and as these will require to be kept in a state of rest for some time, they must be kept moderately cool, and a comparatively dry atmosphere (not an arid dry one) maintained about them. Water must only be given when necessary, and then thoroughly. But in order that moisture may be preserved for a longer period, without the addition of water, it is a good plan to plunge some of the more valuable specimen plants of Heaths, Chorozemas, Platylobiums, and similar sorts, into a size larger pot, and fill the vacancy between the two pots with clean damp moss. This will tend very much to the preservation of an uniform moisture at the roots. All the winter flowering Heaths will be in a slightly growing state, and according as they become sufficiently advanced should be removed to the coolest light and airy situations in the conservatory. Epacrises, which are now advancing

towards blooming, should have a similar treatment. As the Chrysanthemums go out of bloom, those to be procured for next year's supply should have the protection of a cold pit, or at least of some temporary erection moderately secure from frost; the later varieties may still be supplied with liquid manure, to assist them to expand freely; they will also be benefitted by a slight increase of temperature, if the welfare of the other plants will allow of it. As these are removed, let their places be filled up with Chinese Primroses, the earliest Cinerarias, and the other plants so often adverted to as being necessary to be kept in readiness for these purposes. Mignonette in pots will flourish well on shelves close to the glass, where it can get a good circulation of air, without cutting draughts. Be careful in watering, as damp is its greatest enemy. Lachenalias will now be started, and whether in cold pits, or in the greenhouse, should be kept near the glass. Cyclamens, too, are now making growth, after their season of rest, and are worth every attention; they will require a light and airy situation on the front stage of a greenhouse or conservatory, or they may be kept in a pit until the advent of severe frost, at which time they must be removed to where they can have more light and air than can be given in cold pits in such weather. A damp stagnant atmosphere causes both leaves and embryo flowers to go off. Kalosanthes at this season should be kept very dormant; in fact, almost starved by the entire withholding of water, in order to induce a flowering habit. The same may be observed of the general stock of Cactus, and most varieties of Epiphyllum; indeed, of all similar succulent-leaved plants. In order that their treatment may be in some degree assimilated to the dry seasons, to which they are subjected on the sandy plains in their native habitats.

Forcing Houses.

Pineries.—As most of these will now be in a dormant state, considerable care must be exercised in the application of heat and moisture, both to the roots and the internal temperature. It must not, however, be inferred that any are to be left without water at the roots, as they will all require it occasionally; but considering that the other elements are applied on a much reduced scale, it would obviously be very wrong to apply water as often, and in such quantity, as would be given if the whole system of the plants was in an active state. In all cases the wants of the plant in this respect must not be anticipated, and water only applied when necessary, and invariably in a tepid state. Be careful to observe that the bottom heat is kept down for all dormant succession and nursing plants; some, however, of the very forwardest intended for showing fruit early in the forthcoming year, and which should be kept by themselves, may be allowed a little more bottom-heat; and if it appears to be at all declining, a little fresh tan may be stirred in about the surface. These, and also such as are at present in fruit, will require a higher temperature than the general stock of successions. Care must, however, be had to maintain a moderately dry atmosphere, and to admit air as often as external circumstances will allow. Where leaves are used as the medium for bottom-heat, and plunging Pines, a sufficient quantity should be got together immediately, and stacked up in as dry a state as possible, and afterwards thatched, to preserve them so until required for use.

Vineries.—To assist the equal breaking of the vines in the early house, let them be frequently syringed over with tepid water, and also keep up a genial steam by watering and turning over the fermenting materials, and by evaporation. Continue to be moderate in the application of fire-heat. If the buds are well and equally swelled, and their general appearance indicates an active flow of sap, the day temperature may attain 55 degrees, and the maximum at night 50 degrees; but do not exceed those degrees at present. Take every opportunity to give air, more or less, as the weather permits; but some must be given every day, under almost any circumstances—as I am convinced that the oftener the interior air of a forcing-house is changed by admixture with the purer external air, the better for the welfare of the plants. Let a little sulphur be used about this house occasionally: it will do no harm, and may be the means of preventing the ingress of mildew. Keep the late Vines pruned as fast as the fruit is cut, and continue the necessary care for the preservation of late fruit, which has, indeed, been a difficult matter this unprecedented wet season; but it is the province of gardeners to overcome obstacles; and, doubtless, much will be done by keeping the interior air dry, together with a free circulation of air, and the constant removal of decaying berries.

Hardy Fruit Garden.

Pruning and nailing will now be the principal operations in this department, in all the open weather for some time. Take care before the advent of severe weather that all newly-planted trees are well mulched. Peaches may now be loosened from the wall, and all the nails and shreds taken off. Figs also may be unnailed, and the branches tied together preparatory to being protected when frost comes. Regulate the plantations of Raspberries, and make fresh ones where required. Manure and dig between established plants.

Kitchen Garden.

From the continued wet weather, many persons will probably not have been able to get in a first sowing of Peas. It is imperative that this should be attended to as soon as ever the ground is at all fit. A sowing of Mazagan and Early Long-Pod Beans, should also be got in for a first crop. As this is the season when most persons get their seeds, let me recommend a good stock of Thurston's Reliance Pea. I have found from experience that it is worthy the highest encomiums, and shall sow it two for one of any others.

METEOROLOGICAL DIARY.

	Barometer.		Thermometer.			Wind and State.		Atmosphere.			Weat'r.
Day.	9 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m	10 p.m.	
Oct. 24	29.66	29.66	45	56	45	W. S. W.	lively	fine	sun	cloudy	dry
25	29.40	29.43	43	48	42	N. Westerly	lively	cloudy	cloudy	fine	rain
26	29.27	28.92	36	47	38	S. S. W.	strong	cloudy	cloudy	fine	rain
27	28.81	29.16	36	44	43	W. by North	gentle	cloudy	cloudy	cloudy	rain
28	29.30	29.60	42	48	41	N. Westerly	lively	cloudy	cloudy	cloudy	rain
29	29.75	29.46	35	48	45	W. by S.S.E.	fresh	cloudy	cloudy	fine	rain
30	29.66	29.67	45	56	45	W. by South	gentle	fine	fine	cloudy	dry
31	29.62	29.83	48	60	52	W. S. W.	gentle	fine	sun	cloudy	dry
Nov. 1	29.83	29.72	50	61	58	South	lively	cloudy	cloudy	cloudy	rain
2	29.66	29.60	57	60	52	South	strong	cloudy	cloudy	fine	rain
3	29.62	29.74	48	56	48	S. West	lively	fine	cloudy	fine	showers
4	29.85	29.70	41	56	48	S. S. E.	varibl.	fine	sun	cloudy	dry
5	29.44	29.56	48	61	48	S.E., S.W.	id.brsk	fine	sun	fine	dry
6	29.77	29.84	43	54	54	S. West	lively	cloudy	sun	cloudy	showers
7	29.90	30.00	48	58	50	S. West	strong	cloudy	cloudy	fine	showers
8	30.10	30.16	52	60	52	S. West	strong	cloudy	cloudy	cloudy	dry
9	30.20	30.10	52	60	51	W. by N., by S.	gentle	cloudy	cloudy	cloudy	dry
10	30.03	30.00	48	52	45	N. East	gentle	cloudy	cloudy	cloudy	dry
11	29.73	29.43	42	52	52	S. East	lively	cloudy	cloudy	cloudy	rain
12	29.48	29.58	43	46	42	East	forcibl.	cloudy	cloudy	cloudy	rain
13	29.50	29.44	42	46	44	Easterly	gentle	cloudy	cloudy	cloudy	dry
14	29.38	29.30	42	52	49	S.E., S.W.	gentle	cloudy	cloudy	cloudy	rain
15	29.10	29.02	48	55	50	S. West	lively	cloudy	cloudy	cloudy	rain
16	28.93	29.07	50	57	48	S. West	id. var.	cloudy	cloudy	fine	showery
17	29.14	29.20	47	54	43	S. West	id. var.	cloudy	fine	cloudy	showery
18	29.27	29.70	38	45	39	W. S. W.	lively	cloudy	fine	fine	night only
19	29.80	29.60	35	50	50	S. East	gentle	cloudy	cloudy	fine	rain
20	29.54	29.36	45	53	48	S. by E., S. W.	gentle	cloudy	cloudy	fine	rain
21	29.14	29.14	45	55	47	S. by E., by W.	fresh	cloudy	cloudy	cloudy	rain
22	29.14	29.25	43	46	42	E. N. E.	gtl. clm	cloudy	cloudy	cloudy	rain

ESTIMATED AVERAGES OF NOVEMBER.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean
30.27	29.08	62	23	42.9

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
53.2	44.56	48.88

Weather and Phenomena.

October 24—Fresh air; pretty fine. 25 to 29—Very changeable; more or less showery; boisterous wind on the 26th. 30 and 31—Finer, with some sun.

Lunation.—Full moon on the 27th, near midnight.

Nov. 1—Warm; drizzle. 2—Wet and windy; red at sunset. 3—Sunny; wet evening. 4—Some sun. 5—Cheerful, lively air. 6—Heavy shower; drizzle. 7—Storm all night; wet, stormy noon. 8—Overcast; very warm. 9—Red cloudy suffusion at sunset, preceding the reported earthquake in the west. 10—Chilly; overcast. 11—Much rain. 12—Same, with wind. 13—Lull, calm day; overcast. 14—Profuse night rain. 15—Wet morning and night. 16—Showery; clear night. 17—Some gleams, followed by wind and rain in the night. 18—Fine lively day. 19—Change; cirro-stratus; rainy evening. 20—Several hours' rain. 21—Warm, showery day; martins flying about in numbers. 22—Drizzle, and upon the whole dripping wet.

Lunations.—Last quarter, 5th day, 41 m. after midnight. New moon, 11th day, 4h. 41m. afternoon First quarter, 18th day, 2h. 27m. afternoon.

Remarks connected with Agriculture.—Subsequent to the fine weather noticed in the last diary, and which favoured the plough, we have nothing to report in respect to progress, and do not intend to dwell upon the sinister prognostics of evil "looming" in the prospect. Floods are out to a fearful extent; and everywhere, even in our own favoured locality, the land is deeply saturated with water. So wet a season the writer's very long experience cannot retrace; and to make the best of the actual condition the farmer must stand still! Yet, nevertheless, a few days may produce a thorough melioration, and dissipate fear of consequences. We recommend faith and hope.

Croydon, Nov. 22nd. J. Towers.

AGRICULTURAL REPORTS.

GENERAL AGRICULTURAL REPORT FOR NOVEMBER.

From all parts of the country accounts have reached us to the effect that immense quantities of rain have fallen during nearly the whole of the month. In many instances, we learn that considerable damage has been sustained by the floods, whilst most of the low lands, notwithstanding the great exertions made by the farmers to drain them, have been completely covered with water. As might, therefore, be expected, the progress of out-door farm labours has been greatly impeded, and up to the present time, not one-third of the winter wheats have been sown. This is a most unfortunate position of affairs, since it is evident that should a sharp and continuous frost set in, the land will become completely ice-bound, and ploughing will become impossible. Even with the return of fine dry weather, many weeks must, of necessity, elapse ere that operation can be re-commenced; hence we are very apprehensive that an unusually large quantity of field work will be left over till the spring. In that case, we may look forward to a late seed-time; and it is by no means improbable, owing to the increase in the emigration mania, that wages in the whole of the agricultural districts will advance materially above their present level; for where, we ask, is additional labour now to be met with, on the former scale of remuneration? The wheats above ground are looking far from promising, in consequence of the excessive moisture; and some time must elapse ere they will assume their natural colour. The quantity of home-grown wheats threshed out has been very moderate for the time of year, owing to the farmers' time having been much occupied in other details. With the exception of the northern districts, the yield has greatly disappointed the growers, and we need scarcely observe that the general quality and condition of the samples have turned out badly, since, in addition to the damp state in which most of the wheats were harvested, the weather for some considerable time past has prevented the grain in stack from becoming dry, and more suited to millers' purposes. Notwithstanding that the top price of English flour in London has been reduced to 40s. per 280 lbs., the wheat trade has assumed a firmer tone, and, in most instances, the finest parcels have realized an advance of 1s. per quarter, with every reasonable prospect of rather higher rates. Most other articles, including flour, have sold to a fair extent, at full quotations.

Nearly or quite the whole of the potato crop has now been raised, and partly pitted for winter consumption. In most parts of England the yield is considered good as to quantity; but at least one-half of the entire crop has exhibited signs of disease. Our markets have been extensively supplied with most kinds, and fine qualities have sold readily, at full quotations, the best York Regents having realized 120s. per ton; but low kinds have met a very inactive demand, at from 50s. to 65s. per ton. In Ireland and Scotland the disease has not made so much progress as with us. On the continent the produce appears to have somewhat exceeded last year. The imports during the month have amounted to about 4,000 tons, in fair average condition, chiefly from France. On the whole, the accounts respecting the carrot and turnip crops are very satisfactory, the yield and quality having been considerably in excess of some former seasons.

Although the numbers of both English and foreign stock exhibited in our various markets have continued large, a very large business has been doing, and prices have continued to advance. Both beasts and sheep have suffered materially from the effects of the prevailing unseasonably wet weather, and great apprehensions are entertained lest the foot-rot should make its appearance in a bad form. The quantity of stock fatting for Christmas consumption is represented as very extensive, and the free use of oilcake has been productive of a steady rise in the quotations.

Up to the present time, owing to the large imports of foreign grain and flour, very few inroads have been made upon the stocks of new wheat. Old qualities are very scarce, and mostly held by the growers for higher rates.

In Ireland and Scotland the corn trade has assumed a firmer tone; yet very little alteration has taken place in the quotations. Fat stock has commanded remunerative prices, with an improved consumptive demand. The shipments of grain to England have been on the increase.

REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The metropolitan as well as the large provincial markets have been extensively supplied with beasts during the whole of the month just concluded, but their general quality has turned out unusually inferior; indeed, we may venture to observe, that

at least a moiety of the number disposed of has been in a half-fat state. The fact appears to be that the stock has not yet recovered from the effects of the drought in the spring. To remedy the present state of things, recourse has of late been had to large additional quantities of linseed cake, the use of which, we find, is becoming more in fashion even amongst the smaller graziers, and which has produced a decided advance in the prices of both home and foreign parcels. Whether the system will eventually pay remains to be seen; but our impression is that it will not, although the value of each kind of stock is now much higher than it has been for several years past. The supplies of sheep on sale have been by no means large; but then we must bear in mind that slaughtering in the country has greatly increased of late years, and that railway facilities have induced numbers of persons to embark in a trade which, at one time, was wholly foreign to them. Its extent will be more clearly apparent when we intimate that upwards of FORTY THOUSAND CARCASSES of meat have arrived from various quarters up to Newgate and Leadenhall. Even this immense supply has not had the effect of checking the upward movement in the quotations, for the all-important reason that the quantity of live stock sold in Smithfield has not equalled many former seasons, and that consumption has considerably increased. The excited state of the tallow market, arising from the limited shipments from Russia, and the small imports from South America, has produced an important rise in the value of rough fat, which has been quoted at 2s. 8d. per 8lbs., with the prospect of a further advance in it, owing to the short supplies lately forwarded to the tallow-melters. The immense quantities of rain which have fallen in all parts of the country have been productive of serious disadvantage and loss to the stock owners, and the health of both beasts and sheep has suffered to some extent. It is gratifying to observe, however, that the stock of hay on hand for winter consumption is very large, and, further, that the crops of turnips and carrots are proving very abundant and of fine quality.

The imports of foreign stock have been seasonably large; but we must now anticipate a material falling off in them. The general quality of the beasts has been very inferior; but we have noticed a slight improvement in the sheep, calves, and pigs, yet they have changed hands at very low prices. The following arrivals into London have been officially reported since our last:—

	Head.
Beasts	3,102
Sheep	18,152
Calves	1,215
Pigs	427

COMPARISON OF IMPORTS.

Nov.	Beasts.	Sheep.	Calves.	Pigs.
1851....	6,279	22,866	1,409	1,127
1850....	5,928	17,662	1,058	1,486
1849....	4,228	14,204	618	409
1848....	3,488	13,424	669	—
1847....	3,486	16,213	667	41

At the outports the arrivals have been on a very moderate scale, they having been chiefly confined to a few cargoes at Hull, from Germany.

Annexed are the total supplies disposed of in Smithfield:—

	Head.
Beasts	23,063
Cows	462
Sheep	108,975
Calves	1,958
Pigs	2,669

COMPARISON OF SUPPLIES.

	Nov. 1848.	Nov. 1849.	Nov. 1850.	Nov. 1851.
Beasts....	19,700	19,388	19,896	23,583
Cows	600	342	419	435
Sheep....	103,770	120,060	120,206	115,770
Calves ..	1,483	1,113	1,475	1,718
Pigs	2,326	2,116	2,872	3,210

The range of prices has been as under:—

Per 8lbs. to sink the offals.

	s. d.	s. d.
Beef.....from	2 0 to	4 0
Mutton.....	2 6 to	4 6
Veal.....	2 8 to	4 4
Pork.....	2 8 to	4 0

The bullock droves from Lincolnshire, Leicestershire, and Northamptonshire, have amounted to 11,800 short-horns. From other parts of England 3,000 Herefords, runts, Devons, &c., have been received; and from Scotland 386 horned and polled Scots, chiefly per railway.

Newgate and Leadenhall markets have exhibited large supplies of each kind of meat; nevertheless the general demand has ruled steady at full prices. Beef has sold at from 2s. to 3s. 6d., mutton 2s. 6d. to 4s., veal 2s. 8d. to 4s. 2d., pork 2s. 4d. to 4s. per 8lbs. by the carcass.

AGRICULTURAL INTELLIGENCE, FAIRS, &c.

ANDOVER SHEEP FAIR.—Contrary to general expectation, the number of sheep offered for sale was below the general average. The supply from the western counties, &c., was very limited, and sales were readily effected on terms satisfactory to the sellers. The prices obtained were stated as being from 1s. 6d. to 2s. per head higher than at the late Appleshaw Fair, and were about as follow:—Ewes, 24s. to 34s.; wethers, 30s. to 44s.; lambs, 18s. to 39s. each.

ASHBOURN CHEESE FAIR.—The quantity of cheese exceeded our expectations, this being one of the new fairs established this year. Prices ranged from 50s. to 55s. per cwt., some second-rate dairies to let at 48s.

BARNSLEY FAIR.—There was a good supply of store pigs, but only an indifferent demand, and it was considered by dealers that they were fully 2s. per head below late rates. There were very few porkers shewn in the fair.

BAWTRY FAIR.—The supply of stock was large, especially of barren cows. In-calvers were most in demand, and realized higher prices. Steers and good heifers were scarce, and also sold well. All descriptions of grazing beasts were worse to sell. There were a good supply of pigs, which were pretty well cleared off at high prices. The show of sheep was small, which met with ready sales.

BEDALE FORTNIGHTLY FAIR.—We had a good show of all sorts of stock; fat of fair average quality, and in brisk demand at last fortnight's figures. There is still an active inquiry for calving cows, which maintain high prices. Holding stock were looked after also, and well sold off. Masham lambs and lean sheep are 2s. to 3s. a head lower than 2 months ago. Beef, 5s. 3d. to 6s. per st.; mutton, 5d. to 6d. per lb.

BOSTON HORSE FAIR.—There was an excellent show of animals, as regards both numbers and quality. Good cart horses appeared most in request; several yearlings made from £20 to £22; a superior one, belonging to Mr. Holland, of Donnington Wykes, fetched 30 guineas. There was a tolerable sprinkling of dealers.

CALLINGTON FAIR.—There was a good show of sheep, which sold freely. The sale for cattle was not so brisk as at some former fairs, but still there was a pretty good clearance.

CAMELFORD FAIR was better supplied than usual with cattle of all sorts, and a great many bargains were effected at prices much as at late fairs.

CARLISLE FAT CATTLE MARKET was badly supplied with beasts, there being a fewer number than for some weeks past, the quality also generally inferior; the prices asked being high, there was not much business done. The supply of sheep about an average in point of numbers, but inferior in quality; there being, however, a good demand, the whole were disposed of. Beasts, 5s. 3d. to 5s. 8d. per stone; sheep, 5¼d. to 5¾d. per lb. sinking offal.

CASTLE-DOUGLAS FAIR.—The day being very wet, the assemblage of people was not so large as we have seen; yet the show of horses was good upon the whole, and a good deal of business was done. For first-rate draught-horses there was a good demand, and several pairs exchanged hands for prices considerably higher than the exposers anticipated when leading them to market. One pair sold for £80; another was purchased for 70 guineas; and a beautiful three-yesr-old, reared by Mr. Marshall, Parkhouse, in the neighbourhood of Kirkcudbright, met with a ready purchaser at £40, and was considered cheap. From 30 to 40 guineas was a current and average price for good draught horses; and the few posters and inferior animals exhibited fetched, as they usually do, any price which they actually could bring, some more, some less—from £15 down to £2. As a new feature in a Castle-Douglas horse fair, we may mention that some of the best pairs sold to-day were purchased to order for gentlemen in Ireland; we saw one pair of especially good quality and fine appearance bought for a gentleman in the county of Mayo —one of our many enterprising countrymen who have recently either purchased or leased lands in the emerald isle. Cattle: Of two-year-old Galloways 75, ditto one-year-old 112, ditto cows 7, Highlanders 50, Irish 46, Ayrshire queys 7—in all 297. The market was rather a stiff one, but ultimately a good number of the lots changed hands, and prices ranged from £8 8s. down to £4 for Galloways, and for Highlanders from £6 to £3; Irish from £5 to £3.

CHESTER FAIR.—Not many fat stock were shown, and the prices varied from 4½d. to 5½d. Sheep met a ready sale at 6d. to 6½d. Milch cows were very scarce, and realized from £10 to £14. There was a fair show of barren stock, which sold pretty well from £6 to £9. Pigs sold at about 4½d. The horse fair was not numerously attended, and there was not much demand. Good horses were inquired for, but very few were shown. There was a particular demand for weight-carrying hunters.

CHESTER CHEESE FAIR.—There was not quite so large a quantity of cheese pitched as in November last year, but there was a good demand, and all qualities met with a very ready sale. Inferior and middling qualities from 40s. to 50s. The best averaged from 50s., 58s. to 60s.

CHELMSFORD FAIR, notwithstanding the extremely wet state of the weather, was generally well attended, and about an average amount of business was done. The show of beasts was larger than it has ever been known within the recollection of those who have been in the habit of frequenting the fair—there being on sale as many as 2,500, chiefly Welsh beasts, and about half that number were unsold. The prices were—for Welsh steers, from £5 10s. to £8 10s.; ditto heifers, from £4 10s. to £7; ditto calves, from £3 10s. to £5; a few Scots were sold at from £7 to £8 15s.; Herefords readily found purchasers at from £7 to £11 10s. There were nearly 8,000 sheep penned, about one-third of which were turned out unsold, and the prices realized were less than at late fairs and markets; Down ewes, from 27s. to 35s.; lambs, from 17s. to 23s. 6d.; there were few lots of good wethers shown. The horse department of the fair was extremely meagre both as to number and quality, and little business was transacted.

CHIPPING NORTON FAIR.—There was an average supply of mutton, which sold readily at improved prices. The quality of beef was limited; and trade rather dull. Store things realized remunerative rates.

CHIPPENHAM GREAT MONTHLY MARKET was largely supplied with cheese: nearly 200 tons were pitched, which, owing to the heavy rain, came to hand in bad condition; consequently, the trade was dull. Broad double, 42s. to 50s.; prime Chedder, 50s. to 60s.; thin, 36s. to 40s.; loaves, 50s. to 58s. per cwt.

DONCASTER FAIR was very numerously attended. The show of lean stock was unprecedentedly large, in a great measure caused by the late floods depriving the low land farmers of the use of their grass land during the ensuing winter. The flood had also operated injuriously in another respect, because in consequence of it the number of buyers from Lincolnshire was much more limited. With the excess of sellers on the one hand, and the want of buyers on the other, feeding beasts could be purchased on easier terms, and a great number remained undisposed of. Cows and calves and in-calves were in short supply, and commanded better rates. Of fat we had only a limited show, which was unaltered in value. The demand for sheep was far from good. One prime lot of lambs realized 34s., but prices generally ranged from 24s. to 30s. The horse fair was almost entirely confined to those of a very inferior class, in which there was a tolerable amount of business transacted.

DUNSE MARKET.—The cattle were all but composed of shorthorns from the English border counties, with a sprinkling of well-conditioned kyloes. The stock in general was in good condition. In the forenoon sales were dull, the holders of stock holding out for large prices; but having given way a little, sales were made with great rapidity. It was allowed the prices would be about 5 per cent. above Earlston market. There were a few lots of Irish cattle, which were in tolerably good condition, but they met with a dull sale, and were about 10s. a-head down from Hallow Fair. One year-olds horthorns ranged from £4 15s. to £7 15s.; two-year-olds, £8 12s. 6d.; rising three years, from £8 to £10 5s. The show of sheep and lambs was allowed to be about double of what was shown last year, and of first-rate description. The best part of the wether stock would bring about 6d. per lb. Half-bred lambs at 16s. 6d.; three-parts brought 18s. 9d.; and the highest priced lot that could be ascertained brought 23s. A lot of half-bred sheep from Tweedside was sold at 34s. 6d., and several lots between that price and 30s., but the highest in the market was the Bricryhill three-parts, which brought 38s. a-head. The Keiland Lee Cheviot wethers brought 20s. 6d.; and a few lots of this kind ran from the above price to 24s.

GLOUCESTER MONTHLY CATTLE MARKET was more fully supplied than usual with all kinds of stock, the whole of which was of an inferior quality, and a great quantity remained unsold. Beef averaged from 4½d. to 5½d. per lb.; mutton, from 5½d. to 6d.

GLOUCESTER CHEESE MARKET was tolerably well supplied, though the supply was smaller than last market in consequence of the flood preventing many parties leaving home. The quality and condition of the greater part of the cheese were affected by the damp weather. Prices were—best double, 50s. to 56s.; best single, 42s. to 45s.; second ditto, 33s. to 38s.; skim, 25s. to 28s.

ILSLEY FAIR.—The supply of sheep was about 1500, but the attendance of dealers was small. The demand was slow, and prices were much the same as at Appleshaw Fair held last week.

JEDBURGH FAIR.—Notwithstanding the unpropitious state of the weather, the attendance was pretty numerous, although unequal to former years. There was a very poor show

of cattle, which consisted principally of stirks; but as there were plenty of buyers prices ran as high as at any of the recent markets, considering quality, the stirks bringing from £5 to £6 10s. There were very few cows in the market The show of horses was very good, particularly of young draught horses, rising two-and-a-half to three years old, for which there was a good demand, at from £20 to £28, a few superior animals bringing as high as from £30 to £32.

KENDAL FORTNIGHTLY FAIR.—Of cattle there was about an average supply for the time of the year. The supply consisted chiefly of cows, with a sprinkling of heifers and Scots. Cows of the best sort were selling at from £12 to £14; inferior ones, £8 10s. to £10 10s.; heifers, £9 to £12; Scots, £8 to £9 10s. In sheep there was a great falling off in quantity from last market. Southdowns were on offer at from £2 to £2 4s.; cross breeds, £1 9s. to £1 10s.; black-faced sheep at from 19s. to 21s. Those that were unfit for slaughtering of the black-faced breed were disposed of at from 14s. to 15s. Some lots of cross breeds were offering at from 23s. 6d. to 25s. Although dealers were numerous, and the stock of sheep good, sales were not easily effected. The fair may be set down as a very dull one. The average price, per lb., for beef was 4½d., for mutton 5d. No calves at market.

KENMORE MARTINMAS MARKET.—Owing to the very favourable state of the weather, the attendance of country people was very great; there was an abundant supply of butter and cheese, for which very high prices was demanded in the morning, but about mid-day prices fell considerably, and butter and cheese were freely offered at, the former from 14s. 6d. to 15s. a stone, and the latter at about 5s. to 5s. 6d. a stone; cattle, for which there was very little demand, sold pretty high. The sellers preferring keeping them until the Fortingall Tryst, on the 6th proximo, rather than accepting the prices they had been offered.

LAUNCESTON FAIR was well supplied with cattle, and the sale brisk.

LEEDS FORTNIGHTLY FAIR.—The number of beasts was 650, including 43 foreign. There was a fair attendance of buyers, and the trade brisker for beasts of prime quality, which were disposed of at 6s. 8d. per 19lbs.; whilst inferior sold at 6s. 4d., and as low as 5s. 8d.; nearly all cleared off. Sheep, 4,000; all sold at from 5½d. to 6d. per lb.

LINCOLN FAT STOCK MARKET.—There was only a small supply of both beasts and sheep, and the trade was extremely dull throughout. In the few sales which were effected late prices were fully maintained, beef realizing 5s. 6d. to 5s. 9d. per stone, and mutton fully 6d. per lb.

LOCKERBY PORK MARKET.—More dealers and more sellers than usual attended this market. Owing to the very favourable weather for curing, the sales were very brisk, and the whole were cleared off in a very short time at 5s. 4d. to 5s. 5d. per stone.

LOSTWITHIEL FAIR.—A considerable number of cattle were sold at rather an advance in prices. The demand for sheep was not brisk, and but few changed hands.

LOUGHBOROUGH FAIR.—In-calf heifers and good cattle of other descriptions realized tolerably good prices. In the horse fair good prices were readily obtained for the few valuable animals shown.

LOUTH FAIR was unusually well attended. There was a full average show of cattle, beasts selling at the reduction of price lately experienced at other fairs in various parts of the country. Beef, of which there was a scarcity of good quality, making from 5s. to 6s. per stone. There was a small show of sheep; mutton, 6d. per pound. There was a larger show of horses than we have witnessed on any previous fair, but the quality was very indifferent.

MALTON FAIR.—There was a fair supply of in calving cows and heifers, and also of barren heifers and bullocks, all of which had slow sale. A few Galloway heifers and Highland bullocks were about all cleared away; a good show of Irish heifers and bullocks were nearly all sold. On the hill we had a small number of lambs, which had heavy sale. A good supply of pigs had dull sale at about last week's prices. The shambles had a good supply of meat, which had moderate sale. Beef, 5d. to 6d.; mutton, 5d. to 6½d.; lamb, 5d. to 6d.; veal, 5d. to 6d.; pork, 4½d. to 5½d. per lb.; pork pigs, 5s. 6d.; ditto hams, 6s. 3d. to 6s. 6d. per stone.

MARLBOROUGH SHEEP FAIR.—Contrary to general expectation, the number of sheep was greater than has ever been before. The trade was considered to be good and satisfactory to the sellers, as the whole met ready purchasers. The average price fully equalled Applesbaw, but was about 3s. per head below Weyhill. There was a fair supply of horses, which met with a ready sale at good prices. Horned cattle realized a dull sale; but altogether, it was satisfactory to the sellers.

MAYFIELD FAIR was very well attended. The day being tolerably fine, we had a great many home stock exhibited. At the early part of the day the fair was called very brisk; but later, things hung on hand rather, and sellers had to abate their price.

MUIR OF ORD NOVEMBER MARKET.—Scarcely a dealer from the south appeared on the ground, and but very few local purchasers attended the market; consequently there was little demand for the few beasts brought forward—the show, in fact, consisted almost entirely of lots of twos and threes. Prices were considerably below those obtained at the preceding markets in September and October, and sales, even at the reduced rates, were much more difficult to be made than at either of these trysts; compared with last year, the contrary of this was the case. The reason generally assigned for the small show of stock, was that the excellent rates which have recently been obtained for beasts of even indifferent quality induced their owners to bring them forward at the last tryst. Perhaps the fact of falling markets in the south had some effect in keeping back stock.

NEWARK FORNIGHTLY MARKET.—We had a tolersbly good supply of stock, and a great deal of business was done. Prices about the same. There were 325 sheep and 71 beasts penned.

PETWORTH NOVEMBER CATTLE FAIR.—Our annual fair was held on Saturday, but a more miserable day for it could not have been experienced. The rain did not cease till towards the evening, and the fair field was ankle deep in "slush," so that it was with difficulty any one could get about. There was not a large assortment of cattle, but we believe a great deal exchanged hands at fair prices.

RICKMANSWORTH FAIR.—There was a large supply of stock of all kinds. The prime store beasts of all breeds sold well at the late high prices. The young growing and inferior beasts hung heavily on hand, the influence of rain checking both prices and demand, much land in this country being inundated with water, so that the beasts of the latter class were sold at a considerable loss. The demand for both sheep and lambs of all sorts was good at late high prices. Cows for dairy purposes were easier to buy, £18 being the top price for the best. The horse trade for all young animals was brisk at late high figures. Pigs in good demand at an advance of 1s. to 2s. per head for stores, and about 2d. per stone for porkers. Suckling calves have receded from 3s. to 5s. per head.

RIPON FAIR.—There was a good attendance of both buyers and sellers. New calven cows were readily sold; and fat and lean stock had a fair demand.

RUGBY FAIR.—We had a short supply of hunters and carriage horses compared with former years, and they sold readily at good prices. A party of French dealers were located at the George Hotel, and gave high prices for the best horses they could procure. We understand the horses were for the Emperor's own private use. Working horses were better supplied, and vast numbers were disposed of at from £35 to £50. A large number of draught colts were brought, and disposed of at remunerating prices. There was a good supply of fat beasts, which sold at higher rates than last fair. Store beasts are abundant, with an advance. Milking cows were dear.

SETTLE FORTNIGHT FAIR was an improvement on the last. There was decidedly a better show of sheep. Ewes fetched 5d. and 5½d. per lb., wethers 6d. Cows sold at 4½d, and heifers at 5d. per lb. The sale was pretty brisk, both for beef and mutton, and all was cleared off in good time.

SHEFFIELD CHEESE FAIR was attended by a considerable number of persons. So early as Friday se'nnight, above thirty carts well laden with Derbyshire cheese arrived in anticipation of the fair, and the increase of arrivals of cheese from various parts of Derbyshire and Notts gave indications which were subsequently realized, that the fair of '52 would prove more remarkable than any of its predecessors. There was an increase in the supply of Derbyshire and a falling off in the quantity of Cheshire cheese as compared with last year, and also a corresponding increase in price. A great quantity of

cheese was bought while being taken into the fair. On Wednesday prices ranged from 58s. to 60s. per cwt. Cheshire cheese met with ready sale at prices varying from 55s. to 60s. per cwt., and smaller quantities from 5¼d. to 5½d. per lb. A few fine samples of prime Cheshire were sold at 65s. per cwt. There was but a small quantity of inferior Derbyshire cheese in the market, which sold at 48s. per cwt. or 4¼d. per lb. We were confidently informed by two large dealers who had been accustomed to attend the Sheffield fair for 30 years, that the scarcity of Cheshire cheese would justify an opinion that there will be an advance 1d. per lb. before another month has expired. The general trade of Sheffield being good, a great quantity of small purchases were made. Upwards of 300 tons of cheese were conveyed to Sheffield by the Manchester, Sheffield, and Lincolnshire railway.

SHIPSTON-ON-STOUR FAIR was well supplied with fat and store stock; the attendance of buyers was numerous, store stock fetching tolerable prices: beef, 5d.; mutton, wethers, 6d.; ewes, 5½d. No horses shown.

STRANRAER MARKET.—There was a good deal of animation in the market, and prices fully maintained what has been current for two or three months past. Calves were selling from 21s. to 60s.; six quarters from £1 to £5 15s. A very superior lot of this age, from East Diudinnie, were sold at £6 13s. each; these were decidedly the best lot in the field, being a fine specimen of the Galloway breed, and appeared to engage the attention of both local and distant buyers. A bull six quarters old, and from the same stock, was sold by Mr. Adair, Springbank, at £7. A lot of Ayrshire bullocks, fit for stall feeding, were purchased at £8 each. In this district the cattle markets are now concluded for season 1852, and it is to be hoped the spring sales, when they come round, may fully sustain the autumn prices, as well as leave a fair remunerative profit for winter keep, so that the farmers may have no cause for despondency.

STRATTON FAIR was rather thinly attended. The prices of cattle appeared to be still keeping up; steers, from three to four years old, sold from £20 to £22 per pair; cows and calves, £10 to £12 per pair; sheep, 5¼d. per lb.

TRURO FAIR.—There was a smaller supply than usual, and a brisk sale for the animals in the fair. About 250 bullocks changed hands, fat cattle selling at 48s. and 50s. per cwt., and store bullocks at 38s. per cwt. The number of sheep penned was 586, and the selling price was about 5d. per pound.

WEST MALLING FAIR.—There was a large supply of horses and cattle, and an unusually large attendance of buyers. There was a great deal of business transacted, and most of the horses and cattle cleared off at high prices. The quantity of sheep was not so large as usual. It is calculated there was more business transacted than there has been for thirty years past.

YORK FORTNIGHTLY FAIR.—We had a middling supply of beasts, with a fair demand, prime fed selling at from 5s. 6d. to 5s. 9d.; inferior, 4s. 9d. to 5s. per stone; mutton sheep, light weights, 5½d. to 5¾d.; ewes and heavy weights, 5d. per lb. Very few lean sheep at market. Calving and dairy cows were in good supply and demand, at former rates. Lean beasts were plentiful, and they sold well at prices tending upwards. Shorthorns and west country drape cows were most in demand. Many Irish cattle were shown; but they had slow demand, and prices lowering.

IRISH FAIRS.—MULLINGAR: Never, for the last twenty years, would there have been a better in Mullingar had the weather only proved favourable. The rain commenced in the morning, and continued to fall in torrents, and without intermission. Notwithstanding this the Green was thronged from an early hour, and business went on with a briskness almost unparalleled. There was a good demand for stock of every description, and the superior classes of animals shown changed owners at an early hour. Beef sold high at an advance of fully 6 per cent. over the prices obtained at the last fair of Ballinasloe. Three year-old bullocks brought from 10*l.* to 13*l.*, and younger animals in proportion. Three-year-old heifers were also dear, and met a ready sale. Sheep were very scarce, and unusually dear. Wedders sold at from 40s. to 55s., and some were even higher. Lambs were scarce, and some lots brought 30s. The average price was from 25s. to 32s. each. Pigs were very scarce, and not in demand, and there was a great decline in prices. The horse fair was the largest we have had for a number of years. A large number of colts and fillies, three and four years old, met a ready sale at from 20*l.* to 30*l.* each. There was a scarcity of first-class hunters, although many purchasers from England and the continent were present to pick up anything, no matter at what price. Of light hunters there was a large show, also of saddle-hacks and harness-horses, some of which went as high as 50*l.*—*Westmeath Guardian.* BALLINGARRY was largely supplied with stock, but generally of a more inferior description than usual. Buyers were very numerous, and a large amount of business was transacted. Fat cows brought from 8*l.* 10s. to 10*l.*; milch cows, 8*l.* to 9*l.*; two-year-old heifers, 6*l.* 10s. to 7*l.* 10s.; yearlings, 4*l.* to 4*l.* 10s.; weanlings, 3*l.* to 3*l.* 10s.; fat sheep, 32s. to 36s.; lambs, 25s. to 28s. No fat pigs; stores, 34s. to 40s. each; bonhams, 16s. to 22s. per couple—*Kilkenny Moderator.* CASTLEMORRIS was well supplied with stock, but also of an inferior description. Fat cows brought from 7*l.* to 8*l.* 10s.; milch cows, 7*l.* 10s. to 8*l.* 10s.; two year-old heifers, 6*l.* to 6*l.* 10s.; yearlings, 3*l.* to 3*l.* 10s.; weanlings, 48s. to 55s. each; fat sheep, 28s. to 32s.; lambs, 24s. to 27s.; fat pigs, of first quality, 42s. per cwt.; stores, 38s. to 45s. each; bonhams, 18s. to 24s.—*Ibid.* KNOCKANEY. —There was a very large supply of beef, which sold at 31s. to 33s. per cwt., and several lots left without a purchaser. Mutton sold at 5d. to 5½d., sinking offal. CLARE.—Black cattle and sheep were in advance of the prices given at the fair of Quin. Pigs, 35s. per cwt. Great demand for young stock, and all sold at high prices BALLINAKILL was, as usual, largely supplied with stock and well attended by buyers. Fat cows averaged from 9*l.* 10s. to 11*l.* 10s.; new milch cows, 9*l.* 10s. to 10*l.*; two-year-olds, 7*l.* to 8*l.*; yearlings, 4*l.* 5s. to 5*l.*; weanlings, 2*l.* 10s. to 3*l.* 5s.; fat sheep, from 32s. to 38s.; lambs, 26s. to 29s.; fat pigs, 40s. per cwt.; stores, 34s. to 40s. each; bonhams, 20s. to 24s. per couple. The horse fair was well supplied, but with animals of an inferior kind, principally those for farmers' use.

CHERTSEY AGRICULTURAL SOCIETY.—At the Chertsey Agricultural Society, a labourer named King was introduced, who produced a magnificent sheaf of barley, the produce of one single grain. It excited universal admiration, but he made no statement as to the method by which he had obtained so satisfactory a result. Mr. Drummond, M.P., then said. Every one of us, farmers or not, have been beaten by that man. (A voice: Oh, he couldn't do it again.) I say there is none of us, not the best farmer here, but has been beaten by that man. Why, you never got 5,000 for one (a laugh,) 5,375 grains from one grain of barley. Now, till we can all do that, don't let us fancy we have finished learning to farm. That's what we have got to do. What one man can do another can —can't he? To be sure he can. He's got just as many hands and legs. I remember a labourer once talking to a gentleman who seemed to know what he was about, and when he left him, some one said to the labourer, "That's a sharpish sort of fellow." "Oh yes," said the labourer, "a gentleman's got a head as well as another man, if he only knew how to use it." (Laughter.) Well, now, so has a farmer got a head, and if he only knew how to use it, he might get 5,000 grains from one. Now, we are all manufacturers. I don't understand the difference between agricultural and manufacturing interests. We are all manufacturers. Did you ever see a silkworm? Is it not very ingenious to make that nasty looking yellow spider's web into a lady's elegant silk dress? That's what the manufacturer does. What has the farmer got to do? He has to turn a dung-hill into a loaf of bread. Is not that a manufacture just as extraordinary? But he must do it. We have been talking for some time past about the great advantages of reducing the cost of production and the price of labour. But by all this emigration that is going on, the price of labour will be enormously increased. What are you going to do, then— because everybody used to say that nothing could save us, but reducing the price of labour? Well, we must have recourse to more machinery. You can't carry on farming as it has been carried on for the last 500 years. No business in the world can be carried on as it was 500 years ago, and it is nonsense to suppose that ours can either. We must go on improving, for you may depend upon it that chemistry and those things have done as much as they can do. It is to mechanical aid alone, then, that you must look. We are exceedingly behind-

hand in it in the south of England, to what they are in the north. I see, every now and then, advertisements about the prices of production, and farmers' accounts, and so on; and I see everywhere put down farmer's charge for interest on his capital 10 per cent., or, if he is a very modest man, 7 per cent. Now, I want to know in what business in the world a man can get 10 per cent. on his capital. What right, then, has the farmer to expect it, when no tradesman or mercantile man can obtain it? You should expect no more for it when invested in farming than if it were in the public funds, and that is a bare 3 per cent. As for farming, it always must be the poorest trade carried on, and for the best of all reasons, that it is the most agreeable. Do not you know what Cobbett said? He said, "Who would be a nightman if he did not get more for being a nightman than being a farmer?" (Laughter) Isn't it quite clear that being the most agreeable of all occupations, there must be more persons trying to enter into it? An old man once said to me, "Aye, my boy, once farmers talked of making a living, now they talk of making a fortune." Depend upon it he never can make a fortune. He may lead a very pleasant, healthy, and sometimes a profitable occupation; but that must be by greater help than he has got now; and for that help he must look to machinery and improved mechanical contrivances. (Cheers.)

REVIEW OF THE CORN TRADE

DURING THE MONTH OF NOVEMBER.

The new House of Commons has been called together, and the work of the session has been commenced. Sufficient has already transpired to satisfy all, that the Ministry have no intention of attempting to alter the laws regulating the importation of corn into this country. Free trade is accepted by the Derby Government, and Protection is finally given up. Our readers will recollect that on the advent of the present Ministry to power, we warned them against indulging in any sanguine expectations.

The Chancellor of the Exchequer will in the course of another week have propounded his financial scheme, and it will have become known what he proposes to do to mitigate the injury which the agricultural interest of this country has unquestionably suffered in consequence of recent legislation: it would therefore be folly to speculate in this place on the subject.

The freetraders are evidently unwilling to admit that farmers have been sufferers, and seem disposed to oppose all remedial measures. We hope that these gentlemen may yet find that they are not to have it all their own way; but expediency is the order of the day, and farmers must not expect that the promises made by members on the hustings will be very rigidly adhered to.

The prospects for the agriculturists of the United Kingdom are certainly not of the most promising description; we sincerely trust, however, that with courage and energy they may yet be enabled to overcome their difficulties. The seasons have, unfortunately, thus far been adverse; the last harvest was decidedly deficient, and we have a very unpropitious seed-time. The weather has, since we last addressed our readers, been very unfavourable. We have had almost incessant rain; and so great a fall of wet in November has not been experienced for many years past. Large breadths of land have been laid completely under water; rivers have overflown their banks, and extensive mischief has been done to various kinds of property. What the effect of so much wet may be on the seed committed to the soil early in the autumn, cannot as yet be determined; but there is too much reason to fear that it must be decidedly injurious; meanwhile, out-door labour has been completely out of the question, and the soil is so thoroughly saturated that there appears little chance of its being restored to anything like working order until next spring. The probability is, that a portion of the seed committed to the ground in October has been destroyed, and that the land will have to be re-sown. Those farmers who were most forward with autumn work are therefore likely to be in a worse position than those who had not commenced sowing when the rain set in.

Altogether, the seed-time must be regarded as backward and unfavourable—a circumstance very likely to have a material influence on the future. Spring-sown wheat has always been regarded as a more precarious crop than that sown at the usual time; and there can be no doubt that by far the greater breadth of land intended for wheat still remains to be sown. Notwithstanding this somewhat untoward state of things, the value of agricultural produce does not advance materially, owing to the constant large arrivals of foreign grown corn.

Another great disadvantage under which farmers have laboured is the inferiority of the quality of last year's crop, and the effect of the moist weather on the condition. The sale of the new wheat of home growth has, unquestionably, been much interfered with, and its intrinsic value lessened, in consequence of the soft rough condition in which it has come to hand. An interval of frost would remedy this evil, and would be very likely to give an impulse to the demand. Still no very important rise in quotations can be reckoned on so long as the arrivals from abroad continue on as liberal a scale as they have been hitherto. The

future range of prices must therefore depend mainly on the extent of the foreign supplies; and it becomes a matter of the utmost interest to ascertain, as far as practicable, what these are likely to be. That a very large proportion of the late importations of wheat has not paid a profit to the parties importing, is certain; and it appears only reasonable to suppose that operations of that nature cannot be long continued in. At present prices are relatively lower in this country than on the continent; and those who make purchases abroad must, therefore, be very strongly convinced that a considerable rally is about to take place here. We do not think that this feeling is so general as to cause very large transactions to be entered into; and we are consequently of opinion that after what may yet be on passage shall have reached our shores, the supplies will be comparatively short for some months to come.

Whilst on the subject of supplies, we are induced to notice that which has been considered a mystery by all commercial men, and which still remains unexplained. For some time past wheat has been bought at Amsterdam—one of the dearest and least suitable markets on the Continent for such a purpose—and consigned regularly to London. The prices paid at the port of shipment have, in many cases, been higher than those realized at Mark Lane, independent of the expenses of freight, insurance, factorage, &c. The loss must therefore have been immense; still the same course has been pursued week after week, and all manner of rumours have been circulated to explain this apparent commercial anomaly. The latest explanation is attempted by the editor of the *Economist*, who maintains that the Emperor of France, knowing the influence which the London market exercises on prices of wheat all over the world, and the desirableness of preventing high prices of food in France, has been induced to sacrifice a certain amount of money, in order to keep the London market regularly supplied, and check any advance there. We must leave it to our readers to judge of the probability of this version of a mystery, which has certainly puzzled the most experienced men in the trade.

That these imports from Holland have had considerable effect is certain. The house to which the consignments have been made has sold invariably from on board ship without reserve, and a few thousand quarters a-week forced on the market in this way has had a greater influence than would, at first sight, appear likely to be produced thereby. Whether these operations are to be continued, it is of course impossible to say; but there is certainly no great encouragement to those who consign, in the regular course of business, to ship to Great Britain at present. Independent of this, the time of year is against further large shipments from the north of Europe. In Russia, winter has already set in, and in the ordinary course of things we may calculate on the navigation of the Baltic soon becoming impeded by ice. We are therefore inclined to think that the arrivals of foreign bread-stuffs will, for the next four months, be on a more moderate scale than they have been during the past summer and winter; and we still incline to the opinion that farmers will be enabled to obtain somewhat more remunerative rates for their produce during the winter.

At several of the country markets prices have within the last week or two shown a decided tendency of advance, and London has been nearly the only place in which no movement has taken place.

The consumption of old foreign wheat has been enormous; and notwithstanding the large quantities received, stocks are by no means heavy. The shortness of the wheat crop, and the loss of potatoes in Ireland, have rendered it necessary to obtain supplies of bread-stuffs from this side of the Channel, and buyers from Ireland have bought flour and Indian corn freely all through the month at Liverpool and other ports. The shipments of flour from Liverpool coastwise, and to Ireland, have been considerably in excess of the importations from America; and prices are so much higher there than with us, that it is not improbable that a demand may spring up; and we should certainly not be surprised to see buyers of foreign wheat and flour from Lancashire and Yorkshire at Mark Lane.

The deliveries of home-grown wheat have, notwithstanding the low range of prices and the unfavourable state of the weather, been tolerably good, but the demand has about kept pace with the supply at most of the markets in the agricultural districts, and it is only at the ports on the coast and in London, where the arrivals of foreign have been heavy, that any stocks of consequence are held by merchants.

Though wheat has thus far been selling at relatively lower prices than spring corn, the growers have brought forward the former more freely than the latter. This has naturally caused some surprise, and has led to the belief that the productiveness of the barley and oat crops may at harvest-time have been over-rated. The general impression then was that barley had yielded a full average in quantity; and that oats were, in proportion to the breadth sown, by no means deficient. We still entertain that opinion, and are disposed to attribute the smallness of the deliveries of these kinds of grain to the fact that old stocks were com-

pletely exhausted at harvest-time, and that the growers have consequently been compelled to consume the commoner sorts of barley and oats extensively, as feed for cattle, &c.

Until within the last eight or ten days barley continued to rise in value; since then, however, the upward movement has received a check. In some parts of the country as much as 38s., and even 40s. per qr. was at one time paid for superior malting samples, but since then a reaction of 1s. to 2s. per qr. has taken place.

A considerable proportion of the oats grown in England suffered greatly from the wet weather at harvest-time, and really fine samples are scarce. This article has not varied materially in price either in the farmers' markets or at the large consuming towns. The latter have drawn the greater part of their supplies from Ireland and from foreign ports, the consumption of English having for the most part been confined to the localities in which they have been grown.

The shortness of the bean crop was sufficiently well ascertained months ago to account for the high rates at which this article has been selling; and unless larger quantities reach us from abroad than are reckoned on, prices will in all probability be well maintained.

Peas, after a very rapid and important advance, have suffered a smart reaction, which has, no doubt, been caused partly by the extreme and unseasonable mildness of the weather.

With this short notice of the principal changes which have occurred in the country markets, we must dismiss that part of our subject, and now proceed with our usual retrospect of the proceedings at Mark-lane.

The arrivals of home-grown wheat into the port of London have been smaller in proportion than at some of the provincial markets. A considerable part of the shipments from Lincolnshire and that neighbourhood, instead of being directed to the metropolis, have gone to the north and to the channel ports, where prices have been more satisfactory than with us. The supply at Mark-lane has consisted, therefore, principally of Essex and Kent wheat; and those counties have furnished less than usual at the corresponding period of the year. The large choice of foreign wheat which our market has afforded has, however, prevented anything like scarcity being felt; and there has been sufficient competition on the part of sellers to enable purchasers to obtain all they required on reasonable terms. Notwithstanding the very moderate character of the arrivals of home-grown wheat, and the fact that an advance has taken place at most of the leading provincial markets, prices have remained very nearly stationary at Mark-lane since our last. If, however, we make due allowance for the very rough condition in which the samples have come forward, we must consider the turn as having been rather against the buyer; more particularly during the last eight or ten days. We consider that the intrinsic value of the article has been lessened by the extreme humidity of the atmosphere 1s. to 2s. per qr.; and prices having, notwithstanding, remained as they were before, the purchaser has clearly been placed in a somewhat less advantageous position. The new wheat is said to work better than might from its appearance be expected, and with a proper mixture of old it makes capital flour. So small a proportion of Lincolnshire and Cambridgeshire wheat has lately come forward as to cause some competition, and we consider that the finer sorts from thence would at present bring fully 1s. to 2s. per qr. over the prices they might have been bought at a month ago.

The arrivals of foreign wheat have been liberal, and will before the close of the month probably amount nearly to 100,000 qrs. The demand has not been sufficiently active to take off the whole of that quantity, and the stocks in warehouse have consequently rather accumulated. During the first fortnight in November the country inquiry was of a retail character, and the town millers also operated with considerable caution; importers had, therefore, to choose between two alternatives: either to incur landing expenses, or give way in prices. The former course was in most cases pursued; but here and there a parcel was forced off at rather lower rates. Within the last week or two we have been visited by purchasers from different parts of the kingdom, and though the transactions have not been on so extensive a scale as to enable holders to establish any quotable advance, the tendency has been decidedly that way. The demand has run mostly on fair qualities of red, such as have been obtainable at 44s. to 46s.; the finer kinds, such as prime Rostock, at 48s. to 50s. per qr., having met with comparatively little attention. This has also been the case in regard to Danzig wheat; the demand for the finest high mixed has been almost wholly confined to what the London millers have taken, country buyers having declined to pay such prices as 50s. and 52s. per qr., preferring to take the secondary sorts, which they have been enabled to procure at 44s. to 48s. per qr. Black Sea wheat has met with a fair share of attention; the town trade have given a preference to Ghirka and similar sorts, paying 41s. to 43s. per qr. without much hesitation, and Polish Odessa has sold for country use at about 38s. to 40s. per qr. In the early part of the month the arrivals of wheat from ports east of Gibraltar off the coast were large: latterly they have

been more moderate. The greater part of the supply has been taken for Ireland, a few cargoes have been ordered round to London, and the rest has been distributed to various ports in Great Britain. Very full prices have lately been paid for floating cargoes: Polish Odessa has realized as much as 39s. to 39s. 6d. per qr., cost, freight, and insurance, and other sorts corresponding rates.

The top price of town-made flour was somewhat unexpectedly put down 3s. per sack by the principal millers on the 15th inst. in the face of rising wheat markets; this was, we believe, done in consequence of some disagreement, and the reduction has not influenced the value of other kinds of flour. Good fresh country household has sold quite as well, and at fully as good terms since as previous to the reduction, and American has, notwithstanding good receipts from the other side of the Atlantic, crept up in value. Fair brands are now selling, and have for some time past commanded 23s. to 24s., and superfine sorts 24s. to 25s. per brl. Some of the purchases lately made have, we are inclined to think, been on speculation; but a considerable portion has also been taken off the market for immediate consumption.

The supply of English barley into the port of London has not been so large as is usually received in the month of November; the quantity brought forward has, nevertheless, been sufficient to satisfy the demand, and during the last fortnight some decline has occurred in quotations. The highest prices attained for malting qualities were 35s. to 36s. per qr.; choice parcels brought these rates for a week or two, supplies then increased, and on the 15th inst. a decline of 1s. to 2s. per qr. took place. The fall was, however, confined mostly to the middling descriptions of malting and distilling barley, picked parcels of the former nearly maintaining their previous position; indeed the very best sorts are still worth the highest price named above. The demand for foreign old barley for grinding has been extensive, and the receipts from abroad having been only moderate, the value of the article has risen. The late reduction in prices in English has had more or less effect; it has checked the advance, and in some cases some reaction has even occurred, but not to the same extent as the fall in prices of barley of home growth. Very moderate qualities of Danish sold currently previous to the 15th inst. at 27s. to 28s., and fresh heavy samples realized 29s. to 30s. per qr.; the fall from these rates, thus far, has not exceeded 1s. per qr. Egyptian barley has met with ready takers at 22s. to 23s. per qr., but may now be rather more easily bought at the prices quoted.

The sale for malt was lively in the early part of the month, and the tendency of prices was upwards; the demand has within the last week or two slackened, but the advance previously established has been steadily supported.

The arrivals of oats coastwise into the port of London have been trifling, and the quantity received per rail from the eastern counties has been small. From Scotland the receipts have been tolerably good, and from Ireland and abroad we have had rather large arrivals. The dealers have throughout the month conducted their operations with great caution, and the supply has consequently pressed somewhat heavily on the market. Really fine old corn has scarcely varied in value. Archangel and Riga oats having become scarce (the arrivals from Russia having for some time ceased), have commanded full rates; and sweet heavy samples of Danish and Swedish have brought former terms; but all out-of-conditioned foreign, and soft new English, have receded 6d. to 1s. per qr. since our last.

Irish oats, though of good quality and fair weight, have declined to about the same extent—a large proportion of the supply having been from that country. Lately, prices have advanced materially in the sister isle, and the reports from hence being deemed discouraging, shipments from thence are likely to be checked. At present, however, there is a fair quantity remaining on the market, and a considerable number of vessels oat-laden are known to be on passage from Irish ports to London; hence there does not appear to be much chance of any immediate rally in quotations.

English beans have come to hand sparingly, and have brought fully previous prices—say, new ticks, 32s. to 33s.; harrows, 34s. to 35s.; and pigeon, 36s. to 38s. Old beans may be quoted at least 1s. to 2s. per qr. higher than those of this year's growth. The Egyptians which have been received have met ready buyers at high prices, and the article has risen about 5s. per qr. in the course of the last three months.

The great rise which took place in prices of white peas in October has led to increased supplies being directed to this market, and the mildness of the weather having tended to lessen the consumption, a considerable portion of the advance then established has since been lost. The total fall from the highest point has amounted to at least 4s. per qr.; and fine English boilers may now be bought at 40s., whilst it is difficult to exceed 38s. per qr. for foreign. In the value of grey and maple peas no material variation has taken place.

Floating cargoes of Indian corn have continued in active demand for Irish account, and nearly the whole of the arrival off the coast has been taken for that country at gradually improving prices. Latterly, as much as 31s. to 32s. per qr., cost, freight,

and insurance, has been paid for fine Galatz, and proportionate terms have been obtained for other descriptions. Cargoes still on passage have been held at equally high rates; and it is evident that a continued and very large Irish demand is confidently calculated on.

The tone of the foreign advices has not altered since we last addressed our readers. Holders of wheat abroad have not at any time for some months past manifested much anxiety to realize, and latterly a considerable amount of speculation has taken place at several of the Baltic ports in anticipation of an improved English demand. Prices have consequently rather tended upwards in that quarter, and freights and insurances having at the same time advanced, it has become quite impossible to buy there on such terms as to allow of a margin for a profit on sales in England. The latest accounts state that the weather had assumed a wintry aspect, and it was deemed probable that the shipping season would be speedily brought to a close.

At Danzig, 42s. to 44s. had been paid for fine mixed and high-mixed qualities of wheat, and superior parcels had been held at 46s. per qr., free on board, and even higher.

The accounts from Konigsberg are of a similar character; indeed, taking into account the difference in quality, we consider the first-named market the cheaper of the two.

At Stettin some large speculative operations seem to have taken places which had had the usual effect of driving up prices.

The most recent reports from Rostock inform us that good qualities of wheat deliverable immediately had been sold at 40s. to 41s. per qr. free on board; whilst for spring shipment holders had asked 42s. to 43s. per qr., showing that an advance was calculated on during the winter.

At Hamburg some purchases of wheat appear to have been made on Liverpool account, which had naturally had the effect of strengthening the confidence of holders, and red Upland on the spot, weighing 61 to 61½lbs. per bush., had risen from 43s. to 43s. 6d. per qr. free on board.

In the Dutch markets prices are still higher, owing to continued purchases for shipment to England; and in some parts of France the value of wheat is so high that it might almost pay to consign from this country.

In the Mediterranean markets very little change has taken place since our last monthly notice, and no great extent of business seems to have been done there on English account.

From the more distant eastern ports the advices are of some interest. From Alexandria we learn that large purchases of wheat and beans had been made for shipment to Great Britain at high rates, say for the best qualities of Saidi wheat 29s. to 31s., for Beheira ditto 27s. 6d. to 29s. per qr.; for Saidi beans 26s. 3d. to 26s. 8d., and for Beheira ditto 22s. 6d. to 23s. 6d. per qr, free on board. About 28 to 30 vessels were loading for English ports, the whole of which have still to arrive. We may also reckon on further large supplies from Odessa, Galatz, &c.; and some quantity of Flour is still on passage from America.

The latest advices from the latter country inform us that shipments to some extent had been made, but that prices having risen so as to exceed the limits of the English orders remaining on hand, the exports had during the preceding week or ten days fallen off. Both wheat and flour were relatively dearer at New York on the 13th inst. than at Mark Lane at present; and freights were rapidly rising.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter			
WHEAT, Essex and Kent, white, new..	34 to 42	fine up to	46
Ditto ditto old ..	43	47	„	54
Ditto ditto red, new....	32	37	„	40
Ditto ditto old	40	44	„	48
Norfolk, Lincoln, & Yorksh., red..	42	44	„	45
Ditto ditto new	30	35	„	40
Ditto ditto white new.	none		„	—
Ditto ditto old	none		„	—
BARLEY, malting, new	31			33
Chevalier	33			35
Distilling	29			31
Grinding	27			29
MALT, Essex, Norfolk, and Suffolk, new	54	55	extra	58
Ditto ditto old	52	54	„	56
Kingston, Ware, and town made, new	59	60	„	63
Ditto ditto old	57	59	„	61
OATS, English feed	16	19	fine	21
Ditto Potato	19	21	extra	23
Scotch feed	21	23	fine	24
Ditto Potato	22	24	fine	26
Irish feed, white	16	18	fine	20
Ditto, black	16	17	fine	19
RYE	27	29	old	27 29
BEANS, Mazagan	33	34	„	34 35
Ticks	34	36	„	36 38
Harrow	35	37	„	37 39
Pigeon	36	40	„	40 44
PEAS, white boilers	37	40	„	37 40
aple	33	36	„	33 36
Grey	31	33	„	33 35
FLOUR, town made, per sack of 280lbs.	—	—	„	38 40
Households, Town 35s. Country	—	—	„	33 35
Norfolk and Suffolk, ex-ship	—	—	„	29 30

FOREIGN GRAIN.

WHEAT, Dantzic, mixed..	42 to 43	high mixed	45	47	extra	53
Konigsberg	41 43	„	44	45	„	47
Rostock, new	44 46	fine old	43	45	„	48
Pomera., Meckbg., and Uckermk., red	42		44	extra	44	46
Silesian	„ 40		42	white	42	44
Danish and Holstein	„ 38		40	„	40	42
Rhine and Belgium	„ 38		41	old	41	45
French	„ 38		40	white	39	43
Odessa, St. Petersburg and Riga..	33		35	fine	37	39
BARLEY, grinding	26					27
Distilling	27					29
Malting	none				—	—

	Shillings per Quarter.	
Oats, Dutch, brew, and Polands	18	21
Feed	17	20
Danish and Swedish feed	18	20
Stralsund	18	22
Russian	18	19
French	17	18
Beans, Friesland and Holstein	28	34
Konigsberg	34	37
Egyptian	28	30
Peas, feeding	30	36
Indian Corn, white	27	29
Flour, French, per sack	28	32
American, sour per barrel	19	21

fine boilers 36 38
yellow 27 30
fine 33 35
sweet 22 24

IMPERIAL AVERAGES.

For the last Six Weeks.

Week Ending:	Wheat. s.	d.	Barley. s.	d.	Oats. s.	d.	Rye. s.	d.	Beans s.	d.	Peas. s.	d.
Oct. 16, 1852..	37	10	27	8	18	0	30	1	34	1	30	4
Oct. 23, 1852..	38	8	28	8	17	10	25	8	34	2	30	9
Oct. 30, 1852..	39	2	29	5	17	6	26	0	34	7	31	5
Nov. 6, 1852..	39	5	29	9	18	3	24	10	35	3	33	5
Nov. 13, 1852..	39	11	30	2	18	7	27	8	35	4	32	6
Nov. 20, 1852..	40	0	30	6	18	9	29	9	35	6	33	3
Aggregate average of last six weeks	39	2	29	4	18	2	27	4	34	10	31	11
Comparative avge. same time last year	36	5	25	11	17	7	24	4	28	7	27	10
Duties	1	0	1	0	1	0	1	0	1	0	1	0

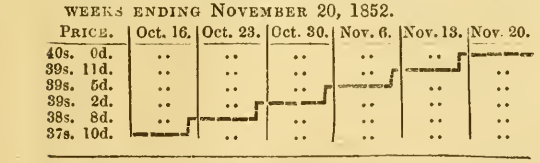
LONDON AVERAGES.

	£	s.	d.		£	s.	d.
Wheat ..	2,213 qrs.	2	3	9	Rye .... — qrs.	0	0	0
Barley ..	2,131	1	12	9	Beans.... 362	1	16	1
Oats	6,955	1	0	3	Peas 364	2	0	3

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last *Gazette*.	Qrs.	Friday's Av. s.	d.	Averages from the corresponding *Gazette* in 1851.	Qrs.	Av. s.	d.
Wheat....	96,792 ..	40	0	Wheat....	104,316 ..	36	9
Barley....	107,391 ..	30	6	Barley....	10,188 ..	27	0
Oats	21,509 ..	18	9	Oats	23,273 ..	18	3
Rye.....	91 ..	29	9	Rye.....	85 ..	23	2
Beans....	5,229 ..	35	6	Beans....	5,129 ..	29	8
Peas	3,332 ..	33	2	Peas	2,799 ..	28	7

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT during the six weeks ending November 20, 1852.



QUANTITY OF FOREIGN GRAIN ENTERED FREE FOR HOME CONSUMPTION during the week ending November 20, 1852.

Wheat, Foreign..	qrs. 22,589	Beans.....	qrs. 3,888
Barley.....	„ 4,794	Peas	„ 3,892
Oats	„ 14,351	Flour	cwts. 19,128

SEED MARKET.

Friday, Nov. 26.

Most of the late arrivals of Linseed having been sold prior to being reported, the quantity on offer is very moderate. Black Sea, for shipment next year, has changed hands at 43s. per qr., all charges included. Archangel is selling at 35s. free on board. Linseed and Rapecakes are the turn higher. Other articles steady.

BRITISH SEEDS.

Linseed (per qr.).. sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton) ..... £8 0s. to £9 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £24
Ditto Cake (per ton) ..... £4 10s. to £5 0s.
Cloverseed (per cwt.) ..... (nominal.)
Mustard (per bushel) new, white 7s. to 10s., brown 7s. to 9s.
Coriander (per cwt.)..... old 9s. to 12s.
Canary (per cwt.) ..... 42s. to 46s.
Tares, Winter, per bush, 4s. 6d. to 5s..... Spring (nominal)
Carraway (per cwt.)..... new 46s. to 47s.; fine 48s.
Turnip, white (per bush.)..... Swede (nominal.)
Trefoil (per cwt.) ..... 21s. to 24s.
Cow Grass (per qr.) ..... (nominal) .. 00s. to 00s.

FOREIGN SEEDS &c

Linseed (per qr.).... Baltic, 43s. to 46s.; Odessa, 45s. to 49s.
Linseed Cake (per ton)..... £7 10s. to £9 10s.
Rape Cake (per ton)..... £4 10s. to £5 0s.
Hempseed, small, (per qr.) 38s. to 42s., Do. Dutch, 40s. to 44s.
Tares (per qr.) .... old, small 25s. to 30s., large 30s. to 32s.
Rye Grass (per qr.) ..... 28s. to 35s.
Coriander (per cwt,)..... (none) 00s. to 00s.
Clover, red (duty 5s. per cwt.)..... (nominal.)
Ditto, white (duty 5s. per cwt.).....

BOROUGH HOP MARKET.

Friday, Nov. 26.

A large business is doing in Sussex Hops, at, in some instances, a further advance in the quotations. All other kinds are in good request, and quite as dear as last week. The show of samples is by no means large.

Mid and East Kent Pockets.	86s. to 150s.	per cwt.
Weald of Kent	80s. „ 92s.	„
Sussex.....	78s. „ 94s.	„

POTATO MARKETS.

Borough and Spitalfields, Friday, Nov. 26.

The arrivals of home-grown potatoes are tolerably good, but in very middling condition. From abroad the supply is a fair average one, viz., 100 tons from Elmshorn, 23 bags from Rotterdam, 80 tons from Leer, 54 sacks from Boulogne, 110 tons from Rouen, 112 tons from Dieppe, and 21 tons from Dunkirk. Selected parcels move off steadily, at full prices, but other kinds are dull in sale.

York Regents	per ton	80s. to 120s.
Lincolnshire do.		75s. to 110s.
Kent and Essex Regents		85s. to 110s.
Scotch do.		80s. to 95s.
Foreign		55s. to 90s.

CHICORY.

Per ton.

	£	s.	£	s.
Foreign root (d.p.)	£	s.	£	s.
Harlingen ..... nominal				
English root (free)				
Guernsey ..... nominal				
York.....	8	8	0	0
Roasted & ground				
English.....	28	0	0	0
Foreign.....	46	0	0	0
Guernsey	42	0	0	0

Duty on all Coffee and roasted Chicory imported, 3d. per lb.: on Chicory Root £21 per ton.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.		s.	s.
Friesland.....	98	to 102	*Cheese, per cwt. Cheshire*	50	to 70
Kiel	88	90	*Cheddar*.....	56	68
Dorset ..... *new*	92	96	*Double Gloucester.*	52	60
Carlow..... „	82	85	*Single do.* ..	44	50
Waterford .... „	78	80	*Hams, York*	94	100
Cork..... „	80	—	*Westmoreland*....	74	80
Limerick..... „	70	74	*Irish*	60	70
Sligo..... „	78	82	*Bacon, Wiltshire, green*	56	60
Fresh, per doz. ..	11	14	*Waterford*	52	54

PROVISION MARKET.

FRIDAY, Nov. 26.

We have a steady demand for all kinds of Irish Butter, at prices fully equal to those paid last week.

Foreign Butter moves off freely, at a rise of from 8s. to 10s. per cwt.

There is more doing in English Butter, the prices of which have advanced 4s. per cwt. Fine weekly Dorset, 94s. to 98s.; middling do., 88s. to 90s.; Devon, 80s. to 92s. per cwt.; fresh, 9s. to 13s. per dozen lbs.

The Bacon market is active at 2s. more money. Hamburgh sizeable, 46s. to 48s.; heavy, 44s. to 46s.; middles firm at 48s. to 50s.

Irish Beef is quoted at £5 15s. for India, and £4 14s. for mess. Irish Pork steady at £6 5s. per tierce, and £3 15s. per barrel for prime mess.

BELFAST, (Friday last.)—Butter: Shipping price, 76s. to 82s. per cwt.; firkins and crocks, 5½d. to 8¾d. per lb. Bacon, 48s to 52s.; Hams, prime, 64s. to 66s.; second quality, 54s. to 56s. per cwt.; mess Pork, 72s. 6d. to 75s. per brl. Irish Lard, in bladders, 60s. to 64s.; kegs or firkins, 58s. to 60s. per cwt.

Nov.	Butter. per cwt.		Bacon. per cwt.		Dried Hams, per cwt.		Mess Pork. per brl.	
18.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1848	77 0	79 0	58 0	60 0	70 0	90 0	80 0	82 0
1849	68 0	72 0	44 0	50 0	60 0	84 0	65 0	67 6
1850	74 0	80 0	34 0	44 0	60 0	62 0	56 0	58 0
1851	77 0	84 0	45 0	47 0	60 0	62 0	58 0	62 0
1852	76 0	82 0	50 0	54 0	64 0	66 0	72 6	75 0

TALLOW MARKET.

FRIDAY, Nov. 26.

Although the demand is by no means so active as on Friday last, prices are well supported. P.Y.C. on the spot, as well as for delivery to the end of the year, is quoted at 47s. 6d. to 47s. 9d. per cwt. Town Tallow is 47s. per cwt. net cash; rough fat, 2s. 8d. per 8lbs. This week's imports are heavy, viz., 6,501 casks from Cronstadt, 1,670 do. from St. Petersburg, 275 from Port Philip, and 630 from Sydney.

HAY MARKETS.

THURSDAY, November 25.

The supplies of both Hay and Straw on offer, were by no means extensive, yet the general demand ruled heavy, at barely stationary prices.

	At per load of 36 trusses. Smithfield.		Cumberland.		Whitechapel	
Meadow Hay..	55s. to	78s.	60s. to	80s.	55s. to	78s.
Clover Hay ..	75s.	97s.	75s.	95s.	75s.	98s.
Straw.....	24s.	30s.	25s.	32s.	24s.	30s.

WOOL MARKETS.

FRIDAY, Nov. 26.

With the exception of English wools being in good request, at the extreme rates paid last week, the demand is in a very sluggish state; importers, however, are very firm. This week's arrivals consist of 813 bales from Algoa Bay, 533 from Bombay, 11 from Ostend, 1,642 from Port Philip, 3,195 from Sydney, 315 from Alexandria, 14 from Smyrna, 152 from Hambro', 145 from Turkey, 2 from Copenhagen, and 555 from Taganrog.

BARK.

English Tree	*per load of* 45 *cwt.*	£11	0	0	*to* £14	0	0
Coppice	„	13	0	0	15	0	0
Mimosa	*per ton*	9	0	0	10	0	0
Valonia	„	14	0	0	16	0	0

TIMBER.

(*Duty paid.*)	£	s.	d.		£	s.	d.
Baltic Timber, per load of 50 *cubic feet*	3	7	6	*to*	4	0	0
Yellow Deals per standard 100	11	5	0	..	16	0	0
Deck Deals, per 40 *feet* 3 *in.*	0	15	0	..	1	4	0
Pipe Staves, per mille	120	0	0	..	150	0	0
Lathwood, per fathom of 6 *feet*	7	0	0	..	9	0	0
Petersburg, Riga, and Archangel	13	0	0	..	16	0	0
Yw. Deals, per stand. hundred							
White	10	0	0	..	11	0	0
Yellow Battens	13	0	0	..	15	10	0
Riga Logs, for 18 *feet cube*	2	0	0	..	4	10	0
Stettin Staves, per mille of pipe	80	0	0	..	100	0	0
Swedish Timber, per load	2	17	0	..	3	0	0
Gothen. Yw. Deals per hun. 12 *ft.* 8*in.* 9*in.*	15	10	0	..	20	0	0
White ditto	15	0	0	..	17	0	0
Yw. Battens, per hd. 12*ft.* 2½*in.* 7*in.*	10	0	0	..	13	0	0
Christiana Yw. Deals per hd. 12*ft.* 3*in.* 9*in.*	17	0	0	..	22	0	0
White ditto ..	15	10	0	..	19	0	0
Quebec and St. John's Spruce Deals, per hundred, 12 *ft.* 3*in.* 9*in.* ..	14	10	0	..	18	0	0
1st quality yw. Pine Deals, per st. hd.	14	0	0	..	17	10	0
Second do. do. ..	11	0	0	..	12	0	0
Third do. do. ..	10	10	0	..	11	0	0
Red Pine Deals per hd. 12*ft.* 3*in.* 9*in.*	15	0	0	..	20	0	0
Red Pine Timber, per load	3	10	0	..	4	0	0
Yellow ditto	3	0	0	..	4	0	0
Birch ditto	2	5	0	..	3	10	0
Elm ditto	2	10	0	..	4	0	0
Oak ditto	3	10	0	..	4	10	0
Standard Staves, per mille Standard	60	0	0	..	70	0	0
Puncheon Staves, per mille	14	10	0	..	18	0	0

MAHOGANY, &c.

Mahogany, St. Domingo	6*d.*	*to*	1*s.*	9*d. per foot*		
Cuba	6		1	6		
Honduras	4¾		1	0		
African	5		0	6		
Cedar ..... *Havanna*	5		0	6½		
Rosewood .. *Rio*	£12		£20	*per ton.*		
Bahia	8	10	12			

HIDE AND SKIN MARKETS.

			s.	d.		s.	d.	
Market Hides,	56 *to* 64 *lbs.*		0	1¾	*to*	0	2	*per lb.*
Do.	64	72 *lbs.*	0	2		0	2¼	„
Do.	72	80 *lbs.*	0	2¼		0	2½	„
Do.	80	88 *lbs.*	0	2½		0	3	„
Do.	88	96 *lbs.*	0	3		0	3½	„
Do.	96	104 *lbs.*	0	3½		0	4	„
Horse Hides			5	6		6	0	*each.*
Calf Skins, light			1	0		2	6	„
Do. full			3	6		5	0	„
Polled Sheep			6	0		7	6	„
Kents			5	2		6	4	„
Half-breds			5	2		6	4	„
Downs			3	10		4	8	„

MANURES.

PRICES CURRENT OF GUANO.

Guano Peruvian	*per ton*	£0	0	0	*to* £9	5	0
„ *In quantities under* 5 *tons*	„	0	0	0	9	10	0
Bolivian Guano	„	7	5	0	0	0	0

ARTIFICIAL MANURES, OIL CAKES, &c.

Peat Charcoal	„	2	15	0	0	0
Nitrate Soda	„	15	0	0	0	0
Nitrate Potash or Saltpetre	„	26	0	0	28	0
Superphosphate of Lime	„	0	0	0	6	0
Soda, Ash or Alkali	„	0	0	0	8	0
Gypsum	„	1	5	0	1	10
Coprolite	„	2	5	0	3	0
Sulphate of Copper, or Roman Vitriol for Wheat steeping	„	27	0	0	29	0
Salt	„	1	1	0	1	5
Bones ½ inch	*per qr.*	0	0	0	0	15
„ *Dust*	„	0	0	0	0	17
Oil Vitriol, concentrated	*per lb.*	0	0	0	0	0
„ *Brown*	„	0	0	0	0	0
Rape Cakes	*per ton*	5	0	0	5	10
Linseed Cakes—						
Thin American in brls. or bags	„	10	0	0	10	10
Thick ditto round	„	8	0	0	8	5
Marseilles	„	0	0	0	0	0
English	„	9	10	0	9	15

END OF VOLUME XXXVII.

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